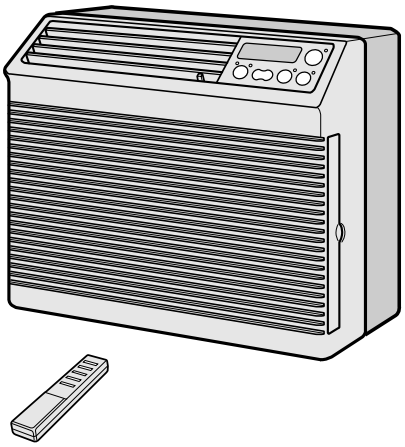
# SHARP SERVICE MANUAL

S3205AFR07CX/



## AIR CONDITIONER

# AF-R50CX
# AF-R55CX
# AF-R60CX
## MODELS AF-R70CX

In the interests of user-safety (Required by safety regulations in some countries) the set should be restored to its original condition and only parts identical to those specified should be used.

**TABLE OF CONTENTS**


| | Page |
|---|---|
| SPECIFICATIONS | 2 |
| EXTERNAL DIMENSIONS | 4 |
| OPERATION INSTRUCTUINS | 5 |
| INSTALLATIOIN INSTRUCTIONS | 14 |
| DISASSEMBLING PROCEDURE | 16 |
| HOW TO REPAIR REFRIGERATION | 20 |
| ELECTRICAL COMPONENT TEST | 23 |
| MICROCOMPUTER CONTROL SYSTEM | 24 |
| TROUBLESHOOTING GUIDE | 28 |
| COOLING LOAD ESTIMATE FORM | 33 |
| RUNNING CONDITION | 35 |
| PACKING AND ACCESSORIES | 37 |
| REPLACEMENT PARTS LIST | 38 |


**SHARP CORPORATION**

This document has been published to be used for after sales service only.
The contents are subject to change without notice.

# SPECIFICATIONS

| Models | | AF-R50CX, AF-R55CX | AF-R60CX | AF-R70CX |
|---|---|---|---|---|
| Cooling capacity | BTU/h | 5000 | 6000 | 7000 |
| Moisture removal | Pints/h | 1.0 | 1.3 | 1.8 |

**ELECTRICAL DATA**

| | | | | |
|---|---|---|---|---|
| Phase | | Single | | |
| Rared frequency | Hz | 60 | | |
| Rated voltage | Volts | 115 | | |
| Rated current | Amps | 4.6 | 5.5 | 6.3 |
| Rated input | Watts | 500 | 600 | 700 |
| Power factor | % | 95 | 95 | 97 |
| EER | BTU/Wh | 10.0 | 10.0 | 10.0 |

**COMPRESSOR**

| | | | |
|---|---|---|---|
| Type | (Hermetically sealed rotary type) | | |
| Model, Motor output | RM5455GQ86, 400W | 39R141AA-04P, 460W | RM5470GQ86, 550W |

**REFRIGERANT SYSTEM**

| | | | |
|---|---|---|---|
| Evaporator | Louver fin, Grooved tube, 7mm, Hair pin | | |
| Condenser | Louver fin, Grooved tube, 7mm, Hair pin | | |
| Control O.D. x I.D. x Length x Q'ty(mm) (Capillary tube) | 2.7 x 1.1 x 400 x 1 | 2.7 x 1.2 x 700 x 1 | 2.7 x 1.3 x 600 x 1 |
| Refrigerant volume R-22(OZ) (Factory change) | 8.5 | 9.2 | 11.3 |

**NET DIMENSIONS**

| | | | | |
|---|---|---|---|---|
| Width Height Depth | inches(mm) | 17-23/32(450) x 14-9/16(370) x 15-1/4(387) | | |
| Net Weight | lbs | 46 | 47 | 50 |

**GROSS DIMENSIONS**

| | | | | |
|---|---|---|---|---|
| Width Height Depth | inches(mm) | 20-7/8(530) x 18-1/8(460) x 18-3/8(467) | | |
| Gross Weight | lbs | 51 | 52 | 56 |

**FAN SYSTEM**

| | | | |
|---|---|---|---|
| Indoor side(Evaporator) | | Centrifugal fan | |
| Outdoor side(Condenser) | | Propeller fan | |
| Air flow rate(indoor side) | CFM | High / Med / Low | |
| | | 195 / 175 / 150 | 190 / 170 / 145 |

**OTHERS**

| | | |
|---|---|---|
| Safety devices | | Compressor: Overload relay<br>Fan motor: Internal thermal protector |
| Air filter | | Polypropylene net |
| Power cord length | ft | 6.0 |
| Power plug type | | 125V, 10A |

**ELECTRICAL PARTS**

| Models | AF-R50CX, AF-R55CX | AF-R60CX | AF-R70CX |
|---|---|---|---|
| Running capacitor | 250V-40μF | 250V-25μF | 250V-40μF |
| Fan capacitor | 250V-6μF | | |
| Thermistor | 15kΩ at 78˚F | | |
| Fan motor | OBM-2016K1 (MLA998) | | |
| Overload relay | MRA99484 | B200-130-141E | KA-122LAI21 |

# WIRING DIAGRAM

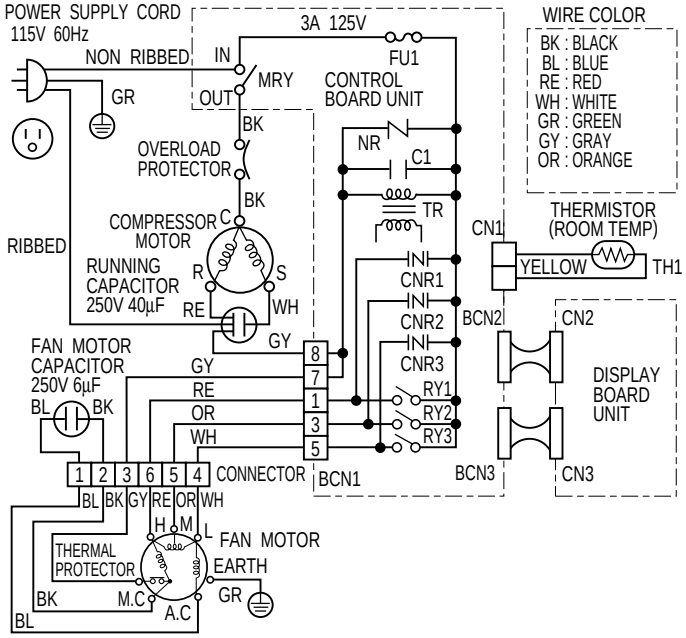



**Figure W-1. Wiring diagram for AF-R50CX, AF-R55CX and AF-R70CX**

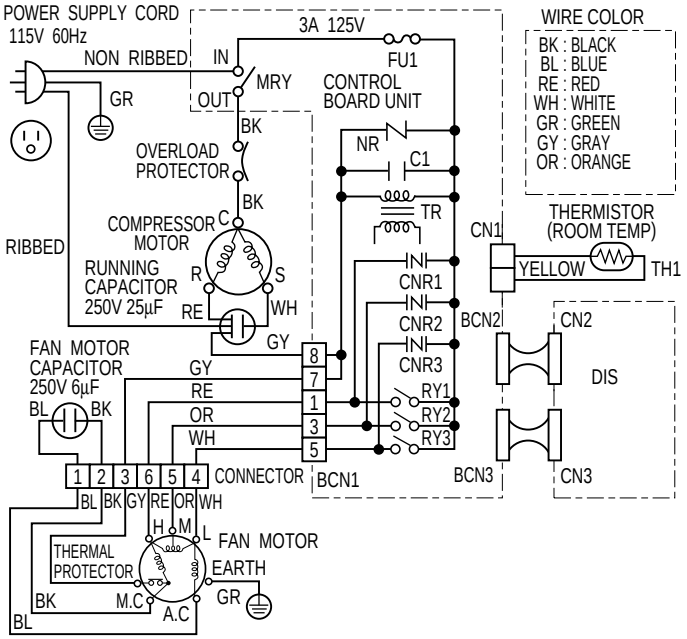
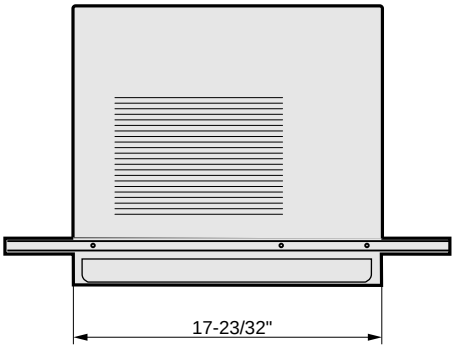
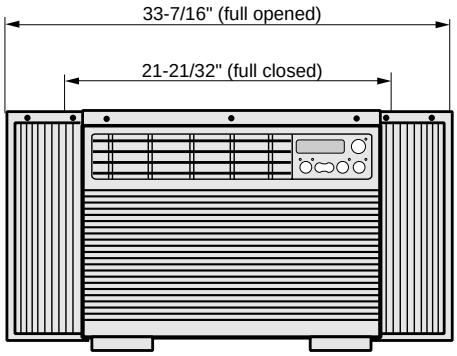
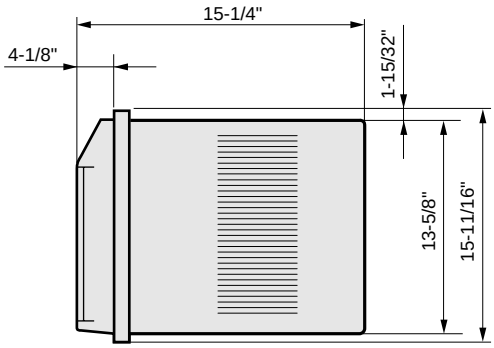



**Figure W-2. Wiring diagram for AF-R60CX**

# EXTERNAL DIMENSIONS.



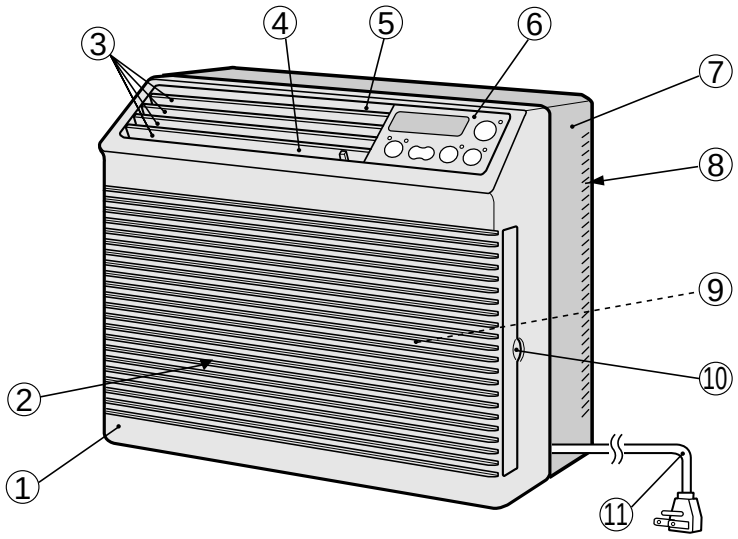



# OPERATION INSTRUCTIONS

## PARTS NAMES

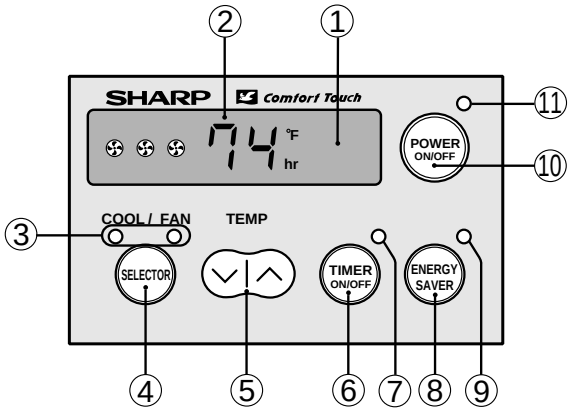
### UNIT



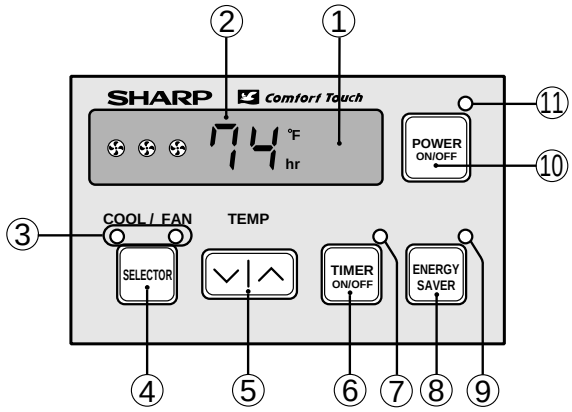

①Front Cabinet
②Air Inlet (Indoor Side)
③Horizontal Louvers
④Vertical Louvers
⑤Air Outlet (Indoor Side)
⑥Control Panel
⑦Rear Cabinet
⑧Air Inlet (Outdoor side)
⑨Filter (Pull the filter handle to the right to remove.)
⑩Filter Handle
⑪Power Cord

### CONTROL PANEL

**AF-R50CX, R60CX, R70CX**

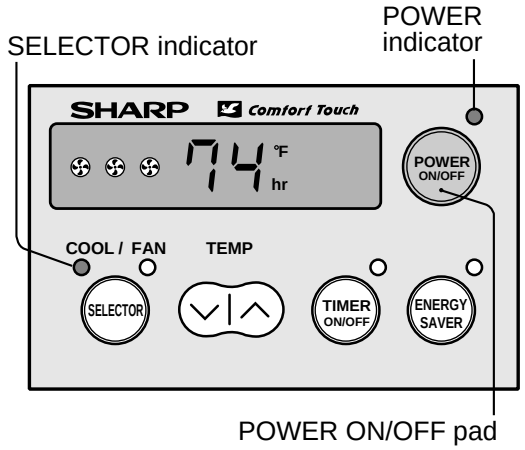



**AF-R55CX**




①Receiver window for remote control signal
②Display
③SELECTOR indicator
④SELECTOR pad
⑤TEMPERATURE setting pad
∨ ----Lower temp ∧ ----Raise temp.
⑥TIMER ON/OFF pad
⑦TIMER indicator
⑧ENERGY SAVER pad
⑨ENERGY SAVER indicator
⑩POWER ON/OFF pad
⑪POWER indicator

# COOLING OPERATION



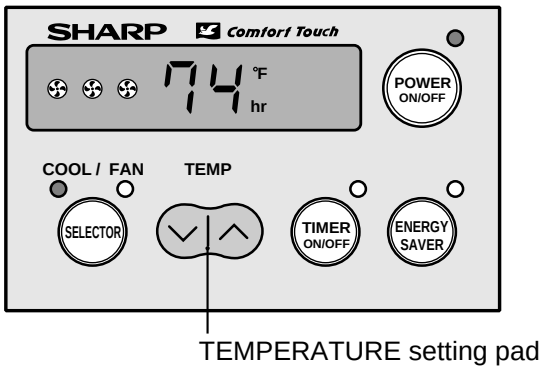

**1** **Touch POWER ON/OFF pad.**

- The unit is preset at 74°F and HIGH COOL. This will show in the display when the power is first turned on.
- POWER indicator and SELECTOR indicator (COOL) will light.

**2** **To turn off the unit, touch POWER ON/OFF pad again**.

- POWER indicator and SELECTOR indicator will go off.

# TO CHANGE TEMPERATURE SETTING




## During cooling operation

**Touch the TEMPERATURE setting pad to adjust the temperature setting.**

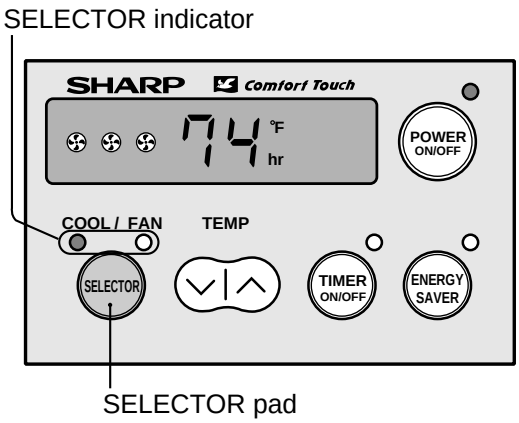
- ⌄ ---Lower temp.
- ⌃ ---Raise temp.

- Temperature can be set within the range of 64°F to 86°F.
- Display will change as you touch the pad.

**NOTE:**

- The latest temperature setting will be memorized and will appear on the display the next time the unit is turned on.
- In cases of power outages or when the unit is disconnected; when the power is restored or the unit is plugged in, the unit and display will return to the preset conditions of 74°F and HIGH COOL. The unit will not automatically turn back on. The user must touch POWER ON/OFF to resume opertion.

# TO CHANGE FAN SPEED AND OPERATION MODE




**During operation**

**Touch SELECTOR pad and select the operation mode and fan speed.**

- SELECTOR indicator and display will light in order as you touch.

HIGH COOL → MED COOL → LOW COOL
↑ ↓
LOW FAN ← MED FAN ← HIGH FAN

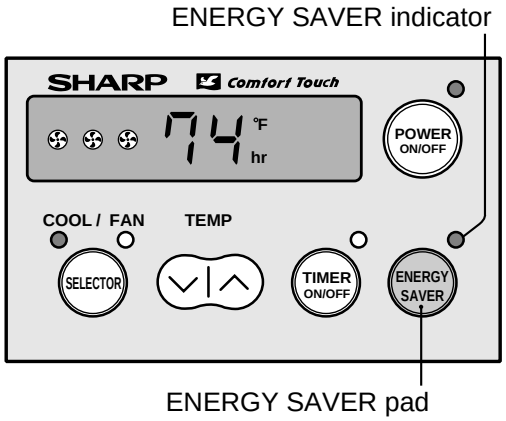
## NOTES ON OPERATION MODE:

| MODE | SELECTOR | DISPLAY | |
|---|---|---|---|
| **HIGH COOL** | COOL | | Cooling operation with high fan speed. |
| **MED COOL** | COOL | | Cooling operation with medium fan speed. |
| **LOW COOL** | COOL | | Cooling operation with low fan speed. |
| **HIGH FAN** | FAN | | Fan only operation with high fan speed. |
| **MED FAN** | FAN | | Fan only operation with medium fan speed. |
| **LOW FAN** | FAN | | Fan only operation with low fan speed. |

- The latest operation mode will be memorized and the selector indicator and display will light when the unit is turned on.
- In fan only operation, the temperature display will go off.
- When the SELECTOR is changed to fan only operation from cooling operation, it will take 5 seconds for the compressor to stop.

# ENERGY SAVER

During normal operation, the thermostat automatically controls cooling and the fan runs continuously. When the ENERGY SAVER is selected, the thermostat automatically controls cooling and the fan automatically stops when the compressor is not operating. (Fan will stop 30 seconds after the compressor stops. After the fan stops, the fan is programmed to rotate for approx. 2 minutes to detect room temperature. This will occur within a 20 min time span.)




During cooling operation

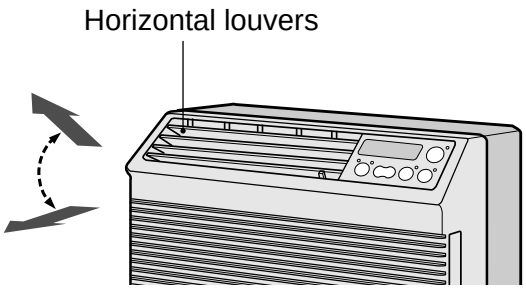
**1** **Touch ENERGY SAVER pad.**
- ENERGY SAVER indicator will light.

**2** **To cancel, touch ENERGY SAVER pad again.**
- ENERGY SAVER indicator will go off.

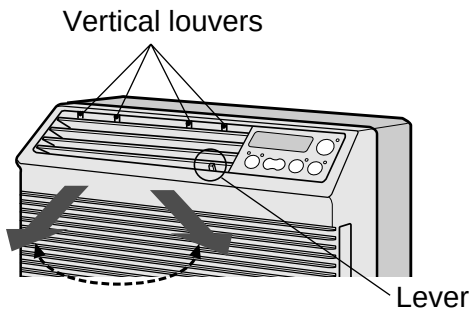
**NOTE:** ENERGY SAVER cannot be set during fan only (HIGH FAN, MED FAN, LOW FAN) operation.

# TO CHANGE AIR FLOW DIRECTION

The horizontal louvers are used to adjust the UP / DOWN direction of air flow, and the vertical louvers are used to adjust the LEFT / RIGHT direction of air flow for uniform and efficient cooling of the room.



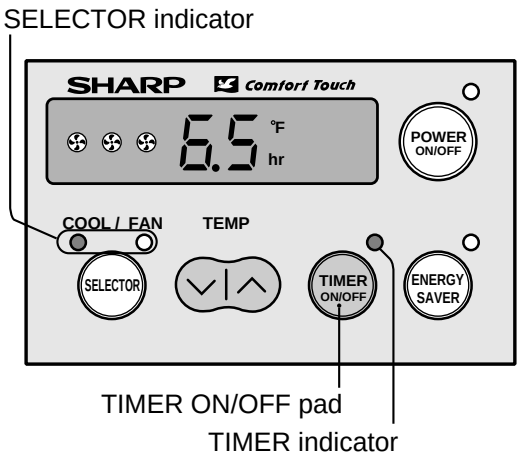

**Adjust UP/DOWN air flow**




**Adjust LEFT/RIGHT air flow**

# ON TIMER OPERATION

- This unit has a built-in timer that can be programmed to start the unit up to 12 hours in advance. You can set the timer to start in increments of 30 minutes (0.5 hours) up to 9.5 hours in advance of the start time, or in 1 hour increments from 10 to 12 hours in advance of the start time.
- The unit will start automatically according to your setting.




(If you wish to start the operation 6 hours and 30 minutes later, set the delay time as shown above.)

## When the unit is not operating

**1 Touch the TIMER ON/OFF pad to set the delayed start time.**

- The time setting will change as you touch the pad. The display will change as follows;

**Preset(0.5h) / Previous setting** → **0.5h** → **1.0h** → **1.5h** ··· → **10h** → **11h** → **12h** → **CL(cancel)**

- The timer will be set, 5 seconds after the TIMER ON/OFF pad is touched for the last time.
- SELECTOR indicator and TIMER indicator will light.
- The time display will count down the remaining time.
- The unit will start when the set time expires. The temperature setting will be displayed.

TO CANCEL THE TIMER SETTING

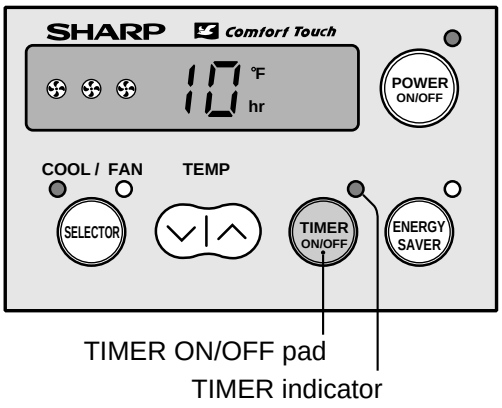
Touch the TIMER ON/OFF pad again after the timer is set, or press the TIMER ON/OFF pad until CL(cancel) appears on the display.

**NOTES FOR TIMER SETTING AND OPERATION:**

- After setting the TIMER, change the temperature and fan speed settings as shown on pages 11 and 12. When the temperature is set in the timer mode, the temperature will show in the display for 5 seconds and then return to the time display.
- The last setting used will be memorized and will appear on the display the next time you operate the unit with the TIMER function.
- If a power failure occurs while the ON or OFF TIMER is set, the TIMER memory will be cancelled and will not resume even after power is reinstated. The unit will not automatically start.
- OFF TIMER OPERATION can also be set with the REMOTE CONTROL.

# OFF TIMER OPERATION

- This unit has a built-in timer that can be programmed to shut the unit off up to 12 hours in advance. You can set the timer to stop in increments of 30 minutes (0.5 hours) up to 9.5 hours in advance of the stop time, or in 1 hour increments from 10 to 12 hours in advance of the stop time.
- The unit will stop automatically according to your setting.

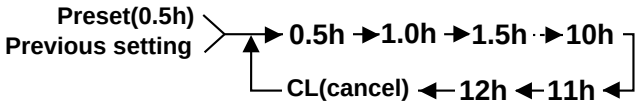



(If you wish to stop the operation 10 hours later, set the delay time as shown above.)

## When the unit is operating

**1** **Touch the TIMER ON/OFF pad to set the delayed stop time.**

- The time setting will change as you touch the pad. The display will change as follows;




- The timer will be set, 5 seconds after the TIMER ON/OFF pad is touched for the last time.
- TIMER indicator will light.
- The time display will count down the remaining time.
- The unit will stop when the set time expires. All indicators and displays will go out.

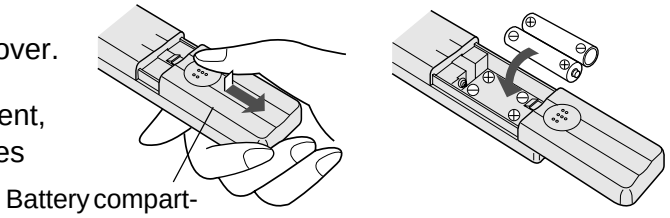
**TO CANCEL THE TIMER SETTING**

Touch the TIMER ON/OFF pad again after the timer is set or, press the TIMER ON/OFF pad until CL(cancel) appears on the display.

# USING THE REMOTE CONTROL

## INSTALLING BATTERIES

**Use two size-AAA (R03) batteries.**




**1** Remove the battery compartment cover.

**2** Insert the batteries in the compartment, making sure the ⊕ and ⊖ polarities are properly aligned.

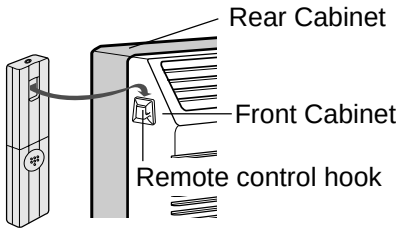
**3** Replace the cover.

**NOTES:**

- The battery life is approximately one year with normal use.
- When you replace the batteries, always use two new ones of the same type.
- If the remote control does not operate normally after replacing the batteries, take out the batteries and replace them again after 30 seconds.
- If you will not be using the unit for a long time, remove the batteries from the remote control.

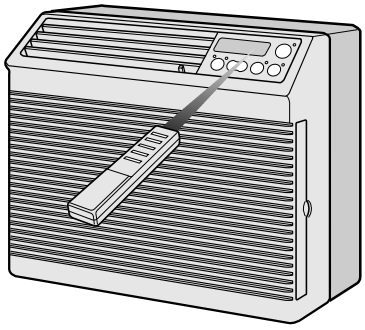
## ATTACHING THE REMOTE CONTROL HOOK

- Remove the backing from the remote control hook.
- Attach the hook onto the left side of the unit's front cabinet.
- To prevent loss, hook the remote control on the front cabinet when not in use.




## HOW TO USE THE REMOTE CONTROL

**Point the remote control towards the unit's receiver window and press the desired button. A beep will sound when the unit receives the signal.**

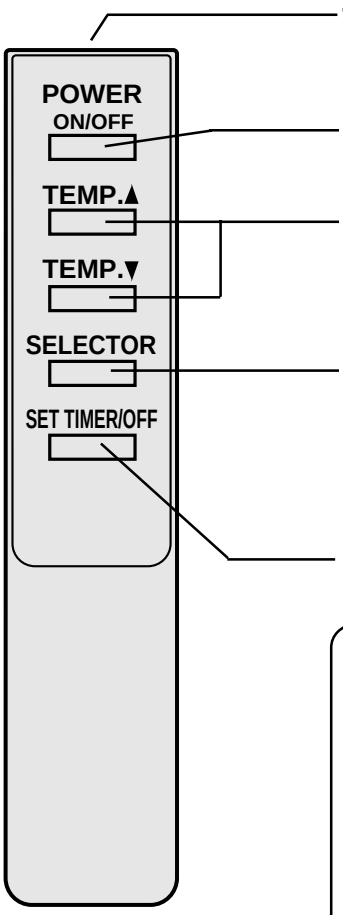


- Make sure no objects, such as curtains, block the receiver window.
- The remote control operates from up to 20 feet (6 meters) away.
- The beep will also sound when each pad on the control panel is touched.

**CAUTION:**

- Do not expose the receiver window to direct sunlight. This can adversely affect its operation. In such case, close the curtains to block the sunlight.
- Use of a fluorescent lamp in the same room may interfere with the transmission of the signal.
- The unit may be affected by signals emitted from the remote control of a television, VCR or other equipment used in the same room.
- Do not leave the remote control exposed to direct sunlight or near a heater. Protect the remote control from moisture and shock which can discolor or damage it.

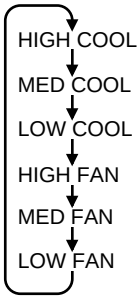
# OPERATING WITH THE REMOTE CONTROL




**POWER ON/OFF button**
Push to start or stop the operation.

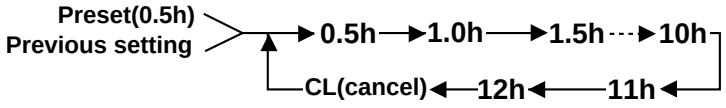
TEMP.▲ ---Raise temp. setting 1°F at a time.
TEMP.▼ ---Lower temp. setting 1°F at a time.

**SELECTOR button**
Push to change fan speed and operation mode.
Fan speed and operation mode selections are shown to the right.




**SET TIMER/OFF button**
Push to set delay "OFF" timer during operation.

- The time setting will change as you push the button. The display will change as follows;



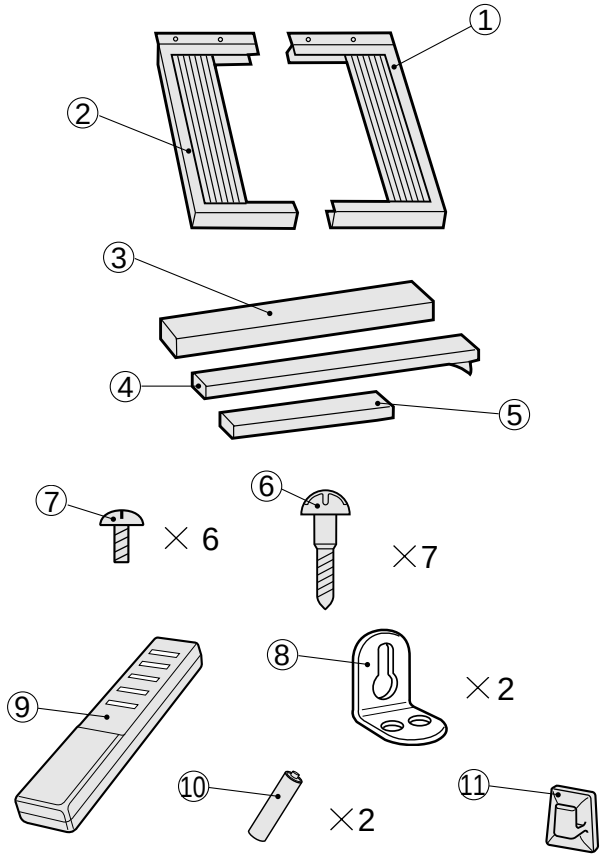

- The last OFF time setting is memorized by the unit and will appear on the display when the button is pushed.
- The timer will be set, 5 seconds after the SET TIMER/OFF button is pushed for the last time.
- If you wish to cancel the timer, push the SET TIMER/OFF button again after the time is set or, push the SET TIMER/OFF button until CL (cancel) appears on the display. A double beep will sound when the timer is cancelled.
- The "ON" TIMER cannot be set with the remote control. It can only be activated by the TIMER ON/OFF pad on the unit's control panel ( See page 9).

**To change temperature setting when ON/OFF timer is in use**

1. Push a TEMPERATURE setting button.
   The current set temperature will be recalled on the unit's display.
2. Use the TEMPERATURE setting buttons to set the new temperature.
   The new set temperature will show on the display for 5 seconds and return to the time display.

# ACCESSORIES

| No. | Accessories | Q'ty |
|---|---|---|
| ① | Right closure assembly | 1 |
| ② | Left closure assembly | 1 |
| ③ | Window sash foam seal | 1 |
| ④ | Window sash foam seal (adhesive type) | 1 |
| ⑤ | Bottom gasket | 1 |
| ⑥ | Screws (L=1", 25.4mm) | 7 |
| ⑦ | Screws (L= $^{13}/_{32}$", 10mm) | 6 |
| ⑧ | Base pan angle | 2 |
| ⑨ | Remote control | 1 |
| ⑩ | Battery | 2 |
| ⑪ | Remote control hook | 1 |



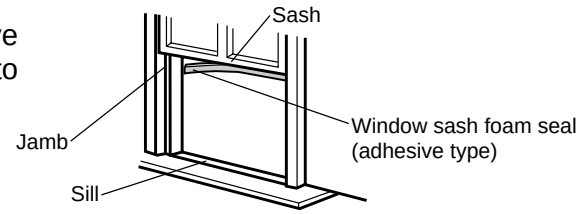

# SUGGESTED TOOLS

1. Screw driver (medium size Phillips)
2. Tape measure or ruler
3. Knife or scissors

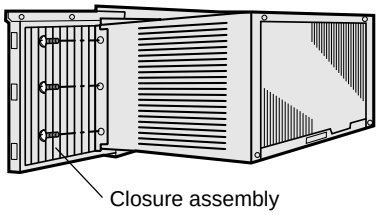
# INSTALLATION

**WARNING: Make sure the unit is turned off and unplugged before working.**

**1** Cut the window sash foam seal (adhesive type) to the proper length and attach it to the underside of the window sash.

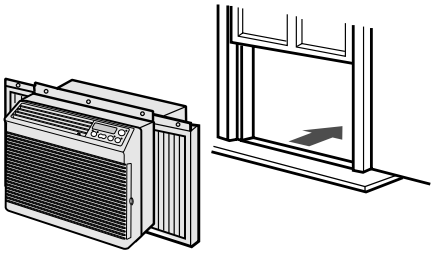



**2** Insert the right closure assembly and the left closure assembly into the top angle and the bottom channels.
Secure the right and left closure to the cabinet with six of the provided screws.
(L= $^{13}/_{32}$", 10mm)



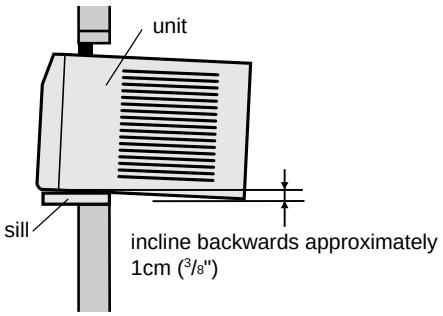

**3** Open the window sash and place the air conditioner on the sill.

Balance the unit on the sill and close the window sash securely behind the top angle.



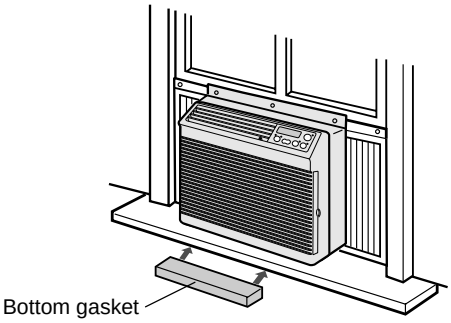
**WARNING:**

At this step, make sure the unit is inclined approximately 1 cm ($^{3}/_{8}$") to the back.
If the unit is not properly inclined, the water collected in the bottom tray during operation will not drain properly and may flow into the room where the air conditioner is installed.

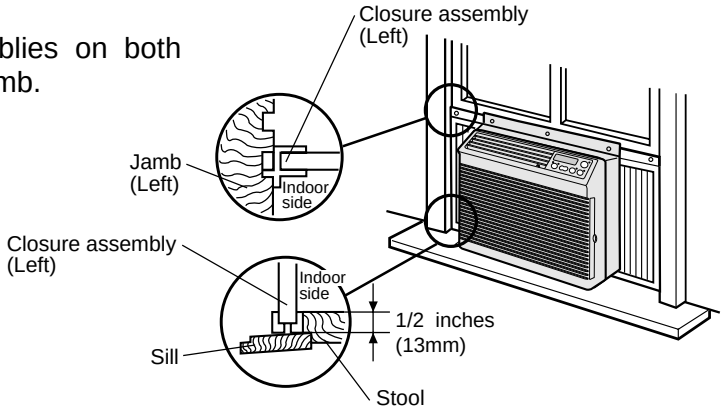



**4** Insert the bottom gasket into the space between the window sill and the bottom of the unit to seal outside air.

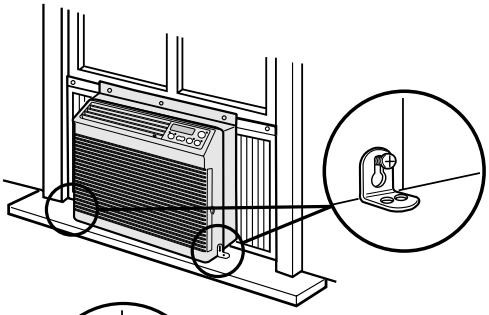
If there is space between the bottom channel and the sill, fill the gap with a thin board or other hard filler.



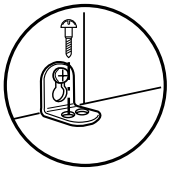
**5** Insert the closure assemblies on both sides into the rails of the jamb.



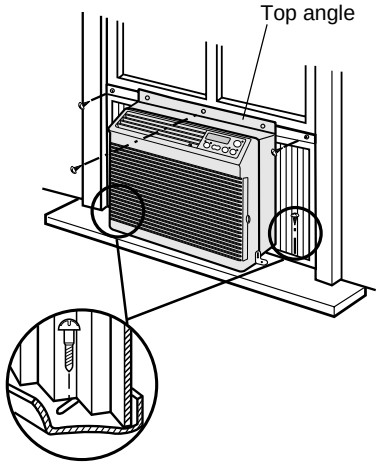

**6** Loosen screws on both sides of the cabinet, then hang the base pan angle on and secure the screws again.



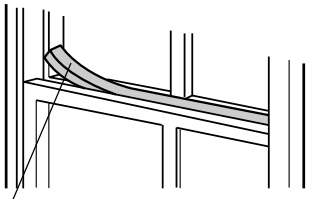
**7** Secure the base pan angle to the sill by using the hole of the front side on the angle with one screw. (L=1", 25.4mm)



**8** Secure the top angle of the unit and the top of the closure assemblies to the sash with three of the provided screws. (L=1", 25.4mm)
And secure the bottom of the closure assemblies to the sill with two of the provided screws. (L=1", 25.4mm)



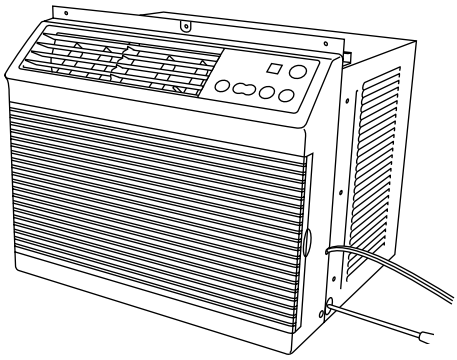

**9** Cut the window sash foam seal to the proper length and seal the opening between the top of the inside window sash and the outside window sash.



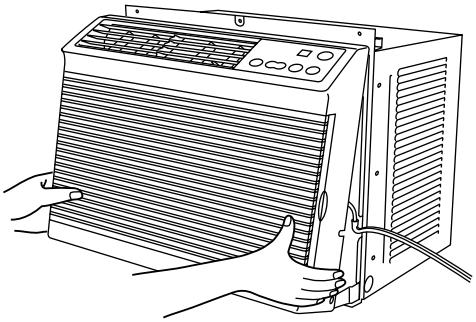
# DISASSEMBLING PROCEDURE

**CAUTION: DISCONNECT THE ROOM AIR CONDITIONER FROM THE POWER SUPPLY BEFORE ANY SERVICE**

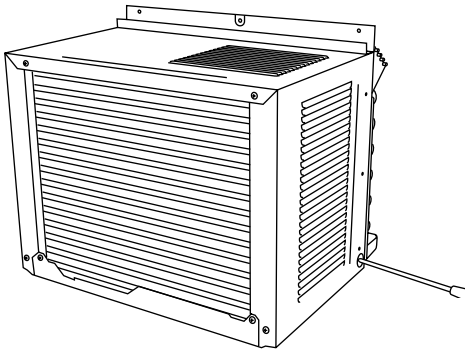
1. Unscrew the 2 screws holding the front panel on each side.



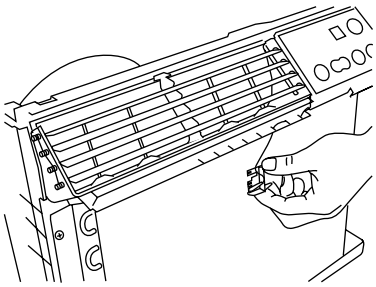
2. Remove the front panel by pulling the front panel at the lower corner toward you about one inch. Next lift up and pull it toward you.



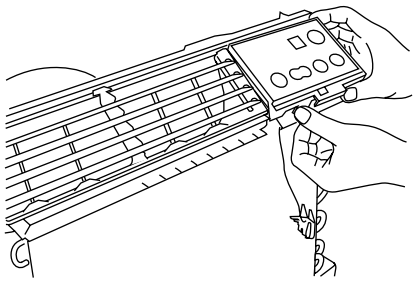
3. Unscrew the 9 screws holding the cabinet.
   2 screws are on each side.
   4 screws are on back side.
   3 screws are on top side.



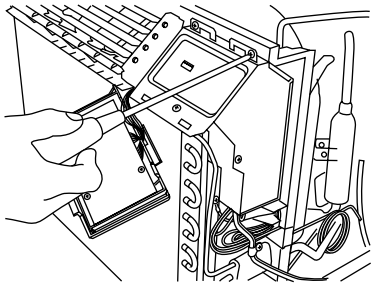
4. Remove the thermistor holder.



5. Remove the control panel.

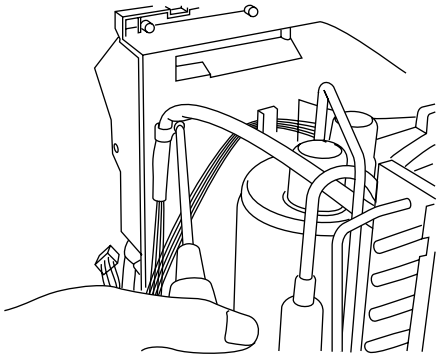


6. Unscrew the 5 screws.
   3 screws are holding the control box at the top and right side.
   1 screw is holding the power supply cord.
   1 screw each screw on the evaporator.

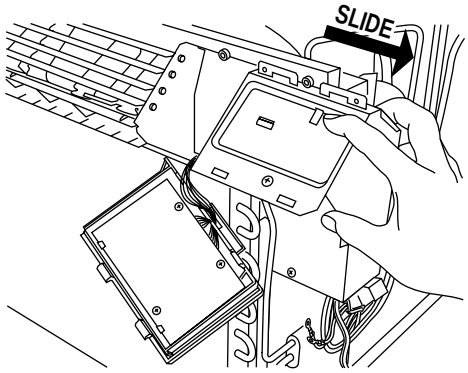


7. Take off the fan motor connector.

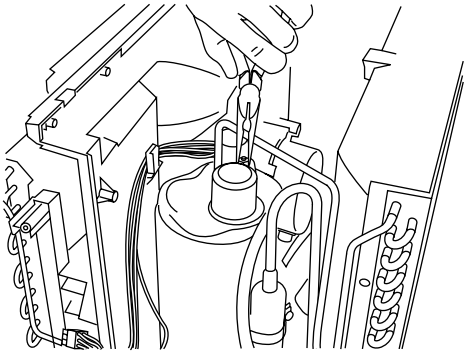
8. Unscrew the 1 screw holding the compressor cord. (Remove the AF-R50CX and AF-R55CX and AF-R70CX)



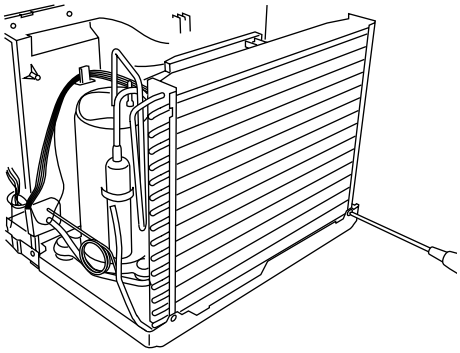
9. Cut the wire fixing band, slide the control box rightward and remove.



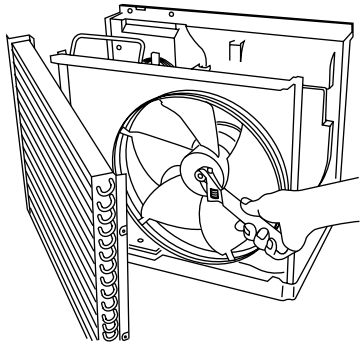

10. Unfasten the one nut at the top of the compressor holding the terminal cover. Then remove the wiring connector of the compressor cord.



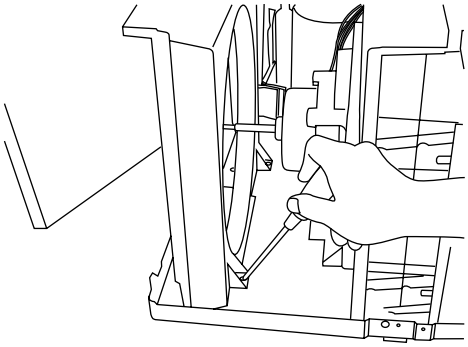
11. Unscrew the 6 screws holding the condenser.
    2 screws are on right side.
    2 screws are on left side.
    2 screws are on back side.
    And remove the condenser from the unit.



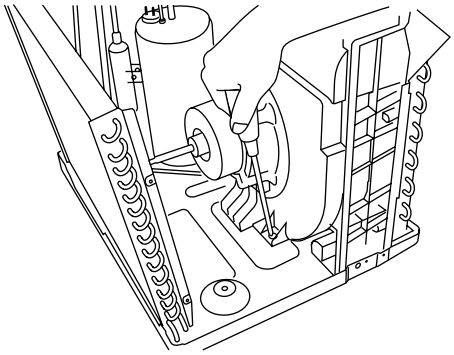
12. Unfasten the nut holding the propeller fan by rotating it counter-clockise. And remove the propeller fan.



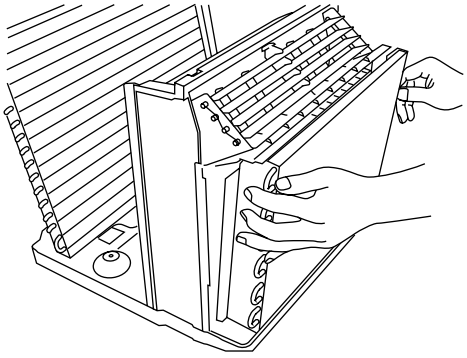
13. Unscrew the 3 screws holding the condenser shround. And remove the condenser shround.



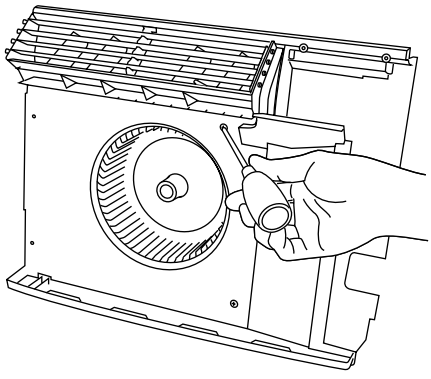
14. Unscrew the 5 screws. 2 screws are holding the evaporator on each side. 3 screws are holding the bulkhead to the base pan on each side and back side.



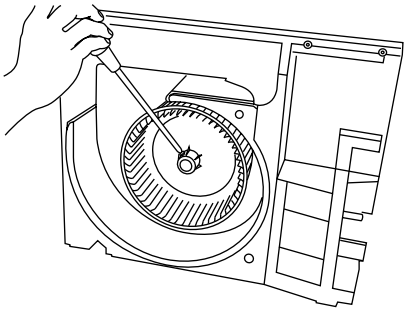
15. Lift up and take out the bulkhead.



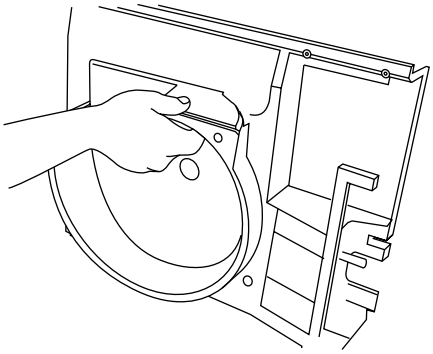
16. Unscrew the 2 screws holding the orifice.



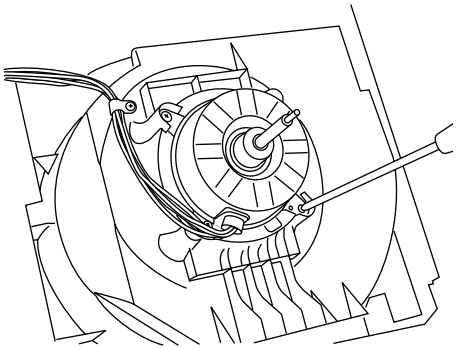
17. Unscrew the 1 screw holding the centrifugal fan.



18. Remove the caseing.

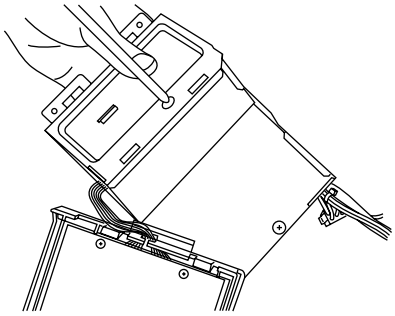


19. Unscrew the 4 screws holding fan motor.

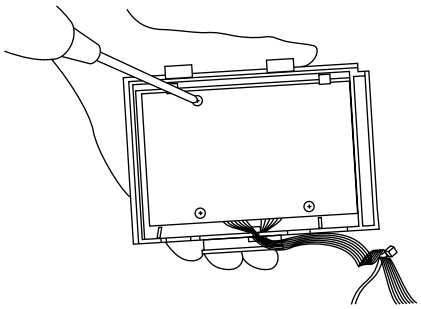


# DISASSEMBLING THE CONTROL BOX

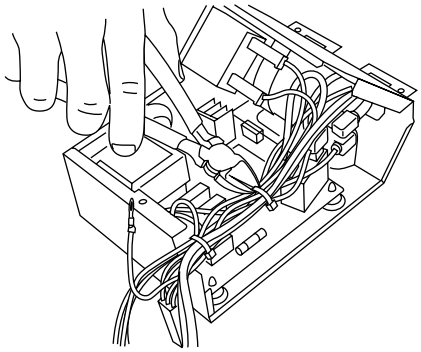
1. Unscrew the 2 screws holding the control box cover.
   **CAUTION:**
   **DISCHARGE THE FAN MOTOR CAPACITOR AND RUNNING CAPACITOR BEFORE TOUCHING THOSE CAPACITORS OR OTHER COMPONENTS OR WIRING.**



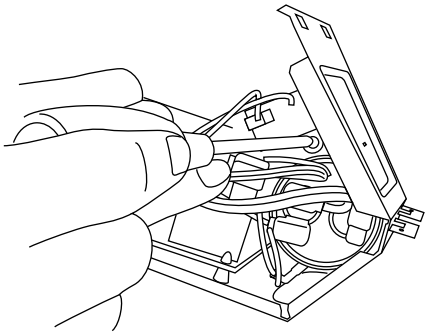
2. Unscrew the 3 screws holding the printed wiring board.



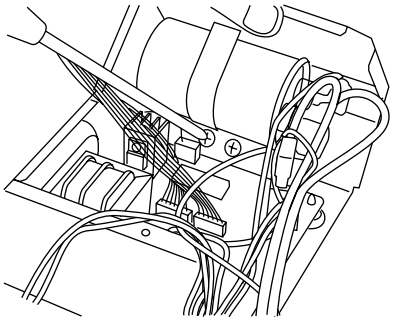
3. Cut the wire fixing bands holding the fan motor lead wires, the compressor cord and the power supply cord.



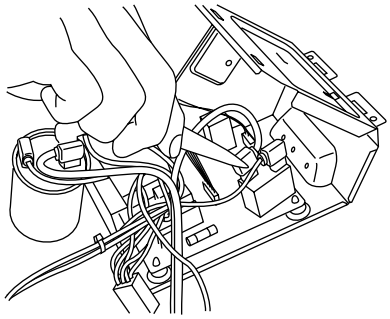
4. Unscrew the 1 screw holding the fan motor capacitor.



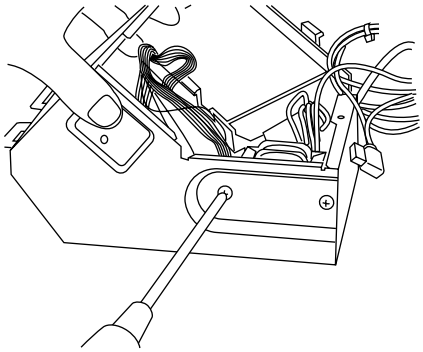
5. Unscrew the 1 power supply cord grounding screw. Unscrew the earth screw. Unscrew the 1 screw holding the capacitor clamp.



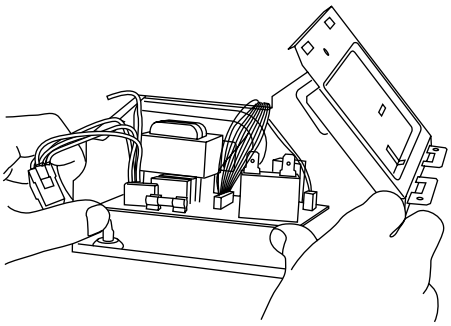
6. Detach each connector by using long-noise pliers.



7. Unscrew the 2 screws holding the transformer.



8. Remove the control board with unhooking the 2 spacers.



# HOW TO REPAIR REFRIGERATION

**Before sealed system work can be preformed a refrigerant recovery EPA and LOCALLY approved certification is required, additionally, EPA and LOCALLY approved refrigerant recovery equipment is required.**

**SEALED SYSTEM REPAIR**

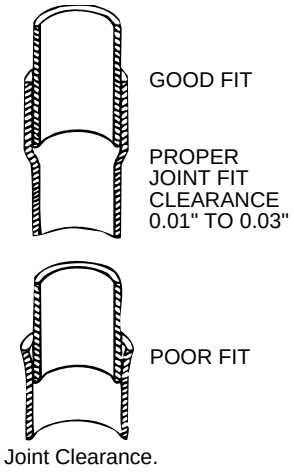
Sealed system repairs should be properly diagnosed before entering into a repair of the system.
It is important to follow proper procedures when doing a system repair for safety reasons and that the repair will result in a restoration of the system to proper factory standards.

**SAFETY REMINDERS**

1) Do not heat any system component with an open flame for any reason.
2) Do not solder until you are sure that all refrigerant has been removed from the system.
3) Do not heat the charging cylinder with an open flame. Use warm water only and do not exceed 125˚F(not too hot to keep your hand in.)
4) Do not over fill any charging cylinders, as they could explode when over filled.
5) Use proper wrenches.
6) Use safety goggles when working with refrigerants.
7) Keep a fire extinguisher within easy reach.
8) Watch flame direction when soldering so as not to burn clothing, wiring or other components.
9) Solder in a well ventilated area. If a high concentration of freon is present, an open flame will create phosgene gas which can be harmful.

**PROPER SOLDERING**

Joint clearances should be maintained so that the brazing alloy will flow between the closely mated surfaces rather than forming large fillets.
This films make the strongest joints, capillary attraction also work best with close tolerance.
The best clearance is between 0.01" to 0.03" , the amount of lap will be approximately 3/8" depending on the swaging tool used. (Figure 1.)

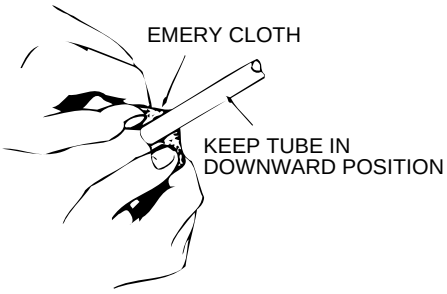



Joint Clearance.

**Figure 1**

**CLEANING TUBING**

To make a sound, leak tight joint, the brazing alloy when raised to brazing temperature, must wet and flow freely over the entire surface of the tubing in the joint area.
To assure this, the tubing surfaces must be free of all dirt, grease, oil and oxides otherwise the alloy will not wet and flow properly over any surface with these elements present. Cleaning can be done with an abrasive cloth or steel wool. Never blow into the tubing because this will introduce a lot of moisture into the system. Open tubing joints should be covered if exposed for long periods of time.




Cleaning Tubing.

**Figure 2**

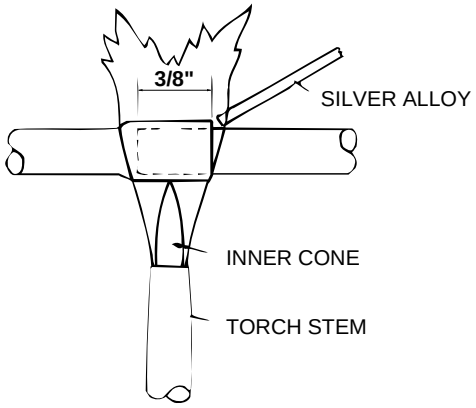
**PROPER FLUXING**

Flux is necessary when using silver solder; it is not required when using silfos on copper to copper joints.

To do a good job the flux should cover the tube surface completely. Be careful not to introduce any flux inside the tubing.

Fluxing should be done after the tubing is mated together and just before brazing is done. Do not allow it to dry out.

When brazing, the flux should become entirely liquid and clear, like water. The temperature will be at 1100˚F and only a little more heat will allow the alloy to flow freely into the joint.




**Directing Torch Flame to Copper Tubing.**

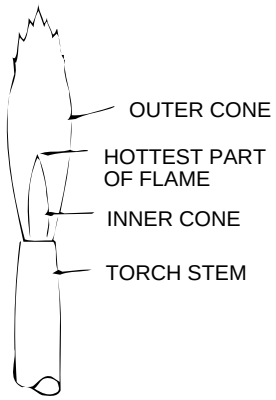
**Figure 3**

**HEATING THE TUBING**

Direct the torch flame so that the larger tube receives most of the heat. Silver solder flows at 1200˚F and silfos flows at 1300˚F.

Heat all around the tubing.

The flame is composed of two cones, a smaller inner cone (pale blue) in calor and a much larger outer cone. The hottest part of the flame is at the tip of the inner cone. The flame should be directed at the joint with the tip of the cone just touching the surface of the tubing. Figure 3 and 4.




**Composition of Torch Flame.**

**Figure 4**

**DEHYDRATING SEALED SYSTEM**

Many servicers feel that since air conditioners run with evaporator temperatures above 33˚F, moisture will not present a problem. Nothing is further from the truth. Oxygen in moisture plus the heat produced during compression will react with the refrigerant oil to produce harmful acids in the system which will break down motor winding insulation, create sludge and pit component parts, reducing efficiency of the air conditioner and shortening the life of compressors.

There it becomes mandatory that good dehydrating practices be adhered to at all times.

Proper hook up procedures as shown in Figure 5 must be used in order to pull and good vacuum from the system.

The use of a good vacuum pump is very important so that the boiling point of any water in the system will be lowered to a point where it will vaporize and be expelled from the system in the form of vapour.

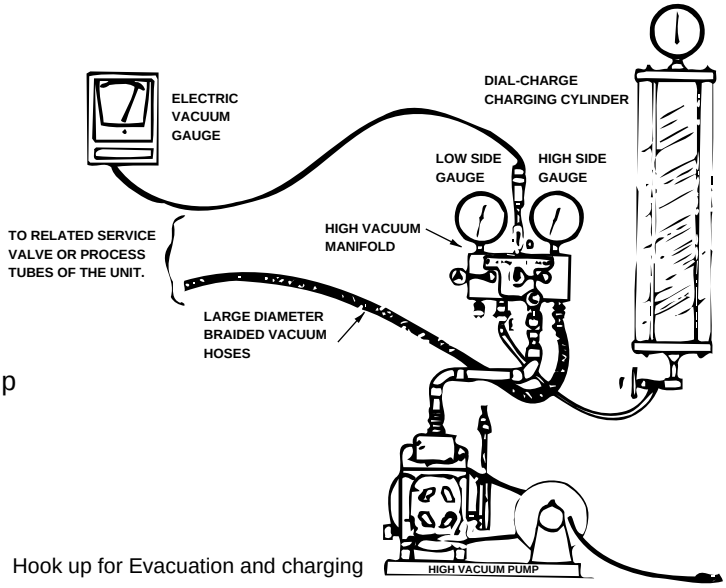
**Type of evacuation methods**

1. **Piston Type Compressor** No good.
   System parts must be above 110˚F.

2. **Rotary Vacuum Pump** Disavantages.
   Low CFMC. 4 oil gets dirty.

3. **Single State Vacuum Pump** will not clean oil.
   Oil must be changed often.

4. **Two Stage Vacuum Pump** will reach 50 microns.
   First stage is below atmospheric pressure.
   Moisture is removed into second stage which works up to atmospheric pressure thus keeping oil clean.
   Manometer cannot be read to 1/2 mm. Micron gauge reads from 25,400 microns to 0.


ELECTRIC VACUUM GAUGE
DIAL-CHARGE CHARGING CYLINDER
LOW SIDE GAUGE
HIGH SIDE GAUGE
TO RELATED SERVICE VALVE OR PROCESS TUBES OF THE UNIT.
HIGH VACUUM MANIFOLD
LARGE DIAMETER BRAIDED VACUUM HOSES
HIGH VACUUM PUMP

Hook up for Evacuation and charging

**Figure 5**

It becomes clear that good equipment and maintained properly must be used in order to remove air and moisture from the system.
When a vacuum of 1,000 to 500 microns is reached, block off the vacuum pump from the system.
This is done by closing the value between the pump and system. If the micron gauge does not increase above 1,000, the system is free of moisture and no leak exists. If the micron gauge increases to higher levels moisture or a leak exists.

**LEAKS**

Several methods are used to detect leaks in systems.

**Electronic Leak Detectors** are very sensitive and are able to detect leaks down to 1/2 ounce per year.
A good electronic leak detector is generally far better in locating very small leaks.
**Halide Torch** be sure the room is free from refrigerant vapours. Watch the flame for the slightest change in calor.
A very faint green indicates a small leak. The flame will be unmistakably changed to green or purple when large leaks are encountered. To simplify leak detection pressurize the system to approximately 75 lbs.
Some leaks can be located by a visual inspection of the system components and solder joints and if oil is found at any given location it generally is a sign that a leak exists at that point due to the fact that flame does carry oil with it travels through the system.

**Soap Bubbles**
Liquid detergents can sometimes assist in finding small leaks by brushing detergent on the suspect area and watching for bubbles. Before applying detergent be sure that the system is pressurized.

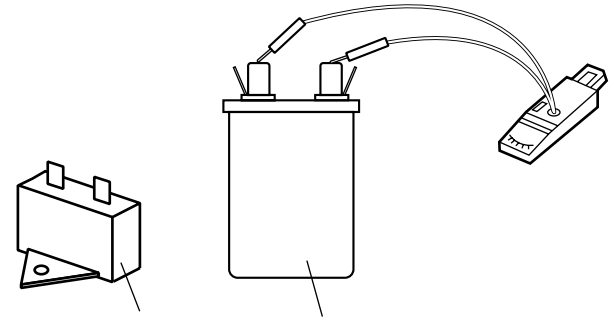
Tap line devices are permissible for diagnosis only they are not suitable when evacuating the system. After the diagnosis has been made they must be removed so that the system will be restored to a hermeticly sealed condition.

# ELECTRICAL COMPONENT TEST

**RUNNING CAPACITOR AND FAN CAPACITOR**

**CAUTION: DISCHARGE THE RUNNING CAPACITOR AND FAN CAPACITOR BEFORE TOUCHING CAPACITOR OR WIRING.**

(1) Discharge capacitor by shorting terminals.
(2) Take the wires off the capacitor terminals.
(3) Set the selector switch of a volt-ohm-meter (or a tester) on the resistance range.
(4) Connect the probes to the capacitor terminals and watch the indicator swing.
The indicator does not swing at all ..... Open.
The indicator swings but does not return ..... Shorted.
The indicator swings, then returns a moment later ..... Good.




**INSULATION TEST**

Check the resistance between the terminals and case.
Reading must be more than 10MΩ at DC 500V.

**OVERLOAD RELAY**

Check continuity between terminals with volt-ohm-meter.

**INSULATION TEST**

Check resistance between terminals and the relay case.
Reading must be more than 10MΩ at DC 500V.

**COMPRESSOR**

(1) Take the wires off compressor terminals.
(2) Set selector switch of volt-ohm-meter on the resistance range.
(3) Put the probes on the terminals of the compressor and check continuity between each terminal.

**INSULATION TEST**

Check the resistance between the terminals and the copper tube.
Reading must be more than 10MΩ at DC 500V.

# MICROCOMPUTER CONTROL SYSTEM

## 1. Temperature control characteristic

1-1 COOL operation
In the “COOL” mode, the thermostat circuit is controlled by two thermostat lines (C1, C2).

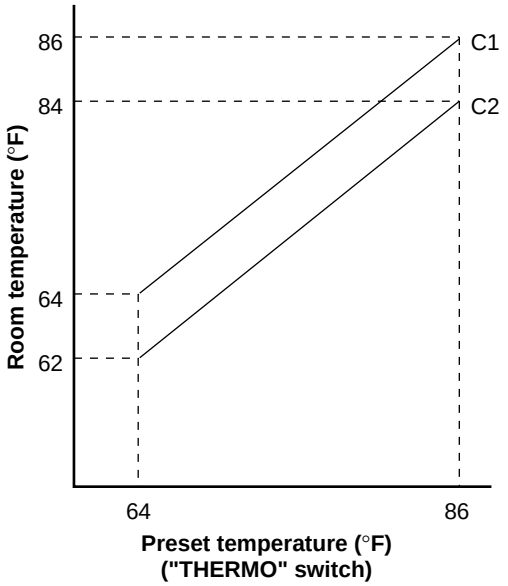



**Figure Y-1**

## 2. Operation mode

2-1 COOL operation
The compressor turns on or off, at thermostat lines C1 and C2. The fan motor is also controlled with the compressor.

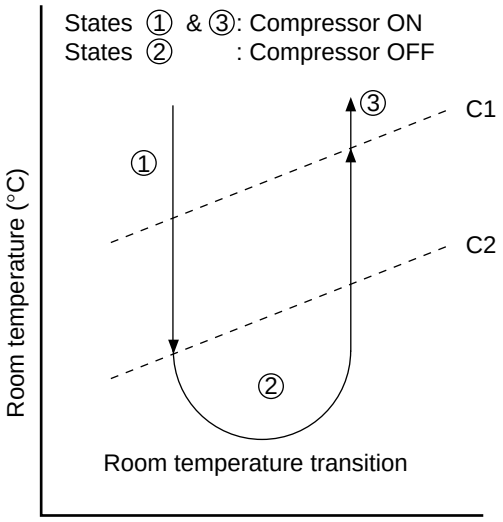



**Figure Y-2**

2-2 FAN ONLY operation
The fan motor always turns on.

## 3. Fan speed

Fan speeds are given by the fan motor, “H”, “M” and “L”, which are available in the following operation mode.

**Table Y-1**

| Selector | Fan motor |
|---|---|
| HIGH COOL | H |
| MED COOL | M |
| LOW COOL | L |
| HIGH FAN | H |
| MED FAN | M |
| LOW FAN | L |

## 4. 12-hours timer

4-1 OFF-TIMER operation
Set the delay timer during operation.
The unit will turn off automatically according to your setting. Timer duration can be set by 0.5 hours to maximum 12 hours. Up to 9.5 hours, you can set by 0.5 hours increments and from 10 to 12 hours, by 1 hour increment.
If you touch button “POWER ON/OFF” during OFF-TIMER operation, then the unit turns off and OFF-TIMER operation is cancelled.

4-2 ON-TIMER operation
Set the delay timer when unit is not operating.
The unit will turn on automatically according to your setting. Timer duration can be set by 0.5 hours to maximum 12 hours. Up to 9.5 hours, you can set by 0.5 hours increments and from 10 to 12 hours, by 1 hour increment.
If you touch button “POWER ON/OFF” during ON-TIMER operation, then the unit turns on and ON-TIMER operation is cancelled.
ON-TIME and OFF-TIME display will count down the remaining time.

from 0.5 to 9.5 ..... 0.5 hours
from 10 to 12 ..... 1 hour

## 5. Energy saver

During normal operation, the thermostat automatically controls cooling and the fan runs continuously whenever the air conditioner is in operation.
When the ENERGY SAVER is set, the thermostat automatically controls cooling and the fan automatically stop when compressor is not operating. (Fan will stop in 30 seconds after the compressor stops.)

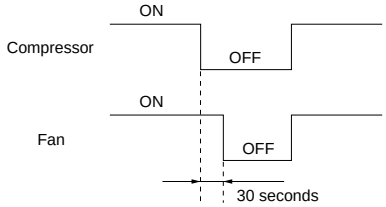



**Figure Y-3**

## 6. Safety start

When you turn the air conditioner OFF and restart again soon, wait at least 3 minutes before the cooling operation starts.

## 7. Test mode

Keep pushing both buttons “POWER ON/OFF” and “ ▼ ” and supply the power, the system will go to the test mode. In this mode, the output operation is switched by pushing buttons. Normal outputs are shown in Table Y-2.

**For selfdiagnosis check mode**

**Table Y-2**

| No. | PUSH KEY (SWITCH) | BEPP SOUND | LED1 | LED LIGHTING | | | | | | | | | | CHECK ITEM and REMARK |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | FAN HIGH <LED2> | FAN MID <LED3> | FAN LOW <LED4> | COOL <LED9> | FAN <LED5> | TIMER <LED7> | ENERGY SAVER <LED8> | POWER ON/OFF <LED6> | FAN OUTPUT | COMP OUTPUT | |
| 0 | PLUG IN the power supply cord while pushing power ON/OFF key and ▼ (down) key. | 2 | 8.8 | ON | ON | ON | ON | ON | ON | ON | ON | OFF | OFF | LED ALL ON |
| 1 | SELECTOR <SW3> | 1 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | LOW | OFF | LED ALL OFF |
| 2 | ▽ <SW6> | 1 | 01 | OFF ※2) | OFF ※3) | OFF ※4) | OFF | OFF | OFF | OFF | ※1) | MIDDLE | OFF | |
| 3 | △ <SW5> | 1 | 02 | ON | OFF | OFF | ON | OFF | OFF | ON | OFF | HIGH | OFF | FAN CHECK |
| 4 | TIMER <SW2> | 1 | 03 | OFF | ON | OFF | OFF | ON | OFF | OFF | ON | OFF | OFF | |
| 5 | ENERGY SAVER <SW1> | 1 | 04 | OFF | OFF | ON | OFF | OFF | ON | OFF | OFF | LOW | OFF | |
| 6 | ON/OFF <SW4> | 1 | 05 | ON | OFF | OFF | ON | OFF | OFF | ON | OFF | HIGH | ON | COMPRESSOR CHECK |
| 7 | POWER ON/OFF by REMOTE CONTROL | 1 | 05 | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | MIDDLE | OFF | REMOTE CONTROL CHECK |
| 8 | POWER SUPPLY OFF | — | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | |

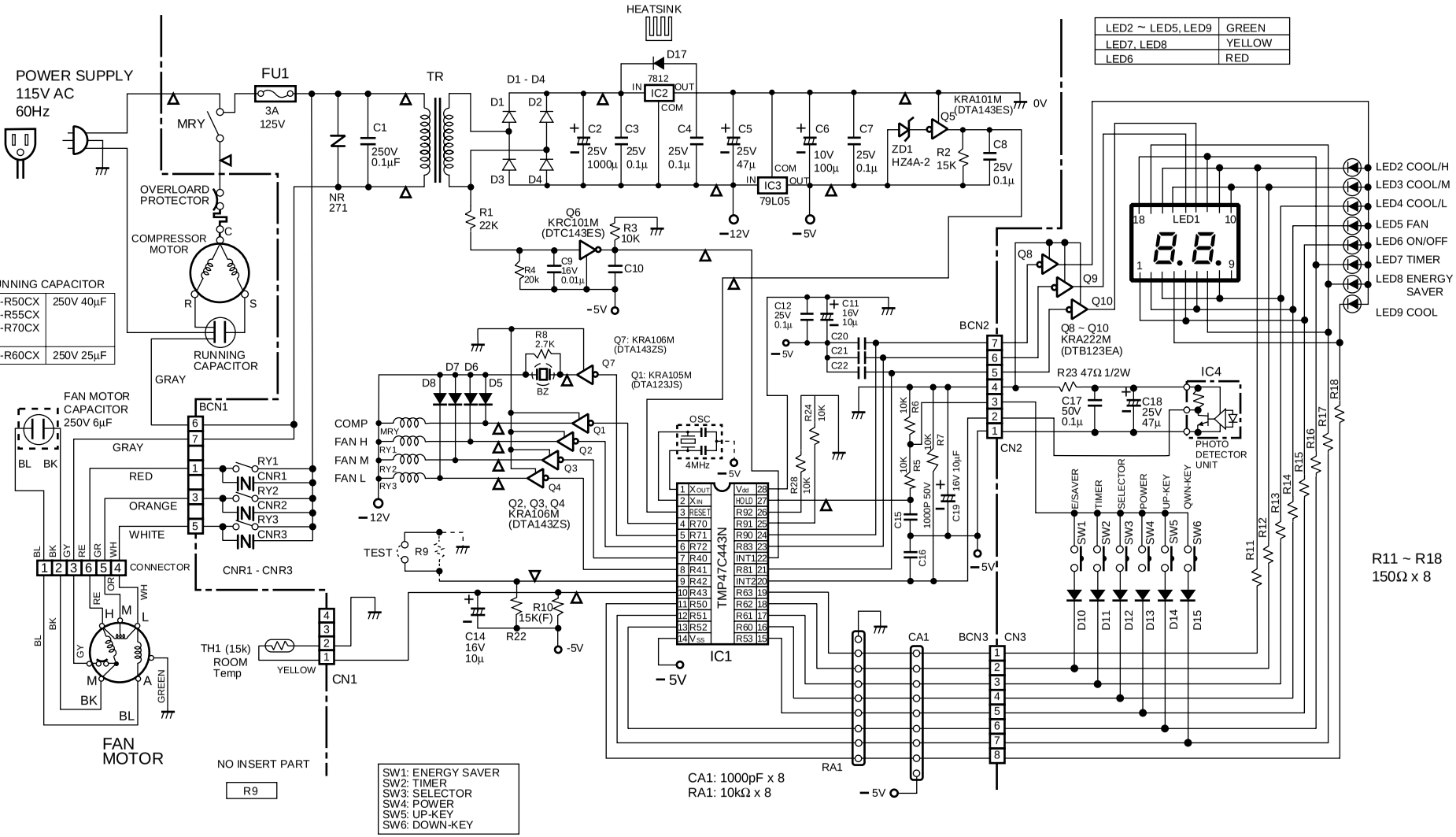
※1) If thermistor is normal (nether short nor open), LED is ON.
※2) When A/D (R42) bit 7 = 1, LED is ON.
※2) When A/D (R42) bit 6 = 1, LED is ON.
※2) When A/D (R42) bit 5 = 1, LED is ON.

**Table Y-3**

| T(˚C) | T(˚F) | R(kΩ) | ※V(volts) |
|---|---|---|---|
| 0 | 32.0 | 49.33 | 1.17 |
| 1 | 33.8 | 46.86 | 1.21 |
| 2 | 35.6 | 44.53 | 1.26 |
| 3 | 37.4 | 42.33 | 1.31 |
| 4 | 39.2 | 40.25 | 1.36 |
| 5 | 41.0 | 38.29 | 1.41 |
| 6 | 42.8 | 36.44 | 1.46 |
| 7 | 44.6 | 34.68 | 1.51 |
| 8 | 46.4 | 33.02 | 1.56 |
| 9 | 48.2 | 31.45 | 1.61 |
| 10 | 50.0 | 29.96 | 1.67 |
| 11 | 51.8 | 28.55 | 1.72 |
| 12 | 53.6 | 27.22 | 1.78 |
| 13 | 55.4 | 25.96 | 1.83 |
| 14 | 57.2 | 24.76 | 1.89 |
| 15 | 59.0 | 23.62 | 1.94 |
| 16 | 60.8 | 22.56 | 2.00 |
| 17 | 62.8 | 21.52 | 2.05 |
| 18 | 64.4 | 20.55 | 2.11 |
| 19 | 66.2 | 19.63 | 2.17 |
| 20 | 68.0 | 18.76 | 2.22 |

| T(˚C) | T(˚F) | R(kΩ) | ※V(volts) |
|---|---|---|---|
| 21 | 69.8 | 17.93 | 2.28 |
| 22 | 71.6 | 17.14 | 2.33 |
| 23 | 73.4 | 16.39 | 2.39 |
| 24 | 75.2 | 15.68 | 2.44 |
| 25 | 77.0 | 15.00 | 2.50 |
| 26 | 78.8 | 14.36 | 2.55 |
| 27 | 80.6 | 13.74 | 2.61 |
| 28 | 82.4 | 13.16 | 2.66 |
| 29 | 84.2 | 12.60 | 2.71 |
| 30 | 86.0 | 12.07 | 2.77 |
| 31 | 87.8 | 11.57 | 2.82 |
| 32 | 89.6 | 11.09 | 2.87 |
| 33 | 91.4 | 10.63 | 2.93 |
| 34 | 93.2 | 10.19 | 2.98 |
| 35 | 95.0 | 9.78 | 3.03 |
| 36 | 96.8 | 9.38 | 3.08 |
| 37 | 98.6 | 9.00 | 3.13 |
| 38 | 100.4 | 8.64 | 3.17 |
| 39 | 102.2 | 8.30 | 3.22 |
| 40 | 104.0 | 7.97 | 3.27 |

※V ..... Input the voltage of microcomputer (No. 10-port).



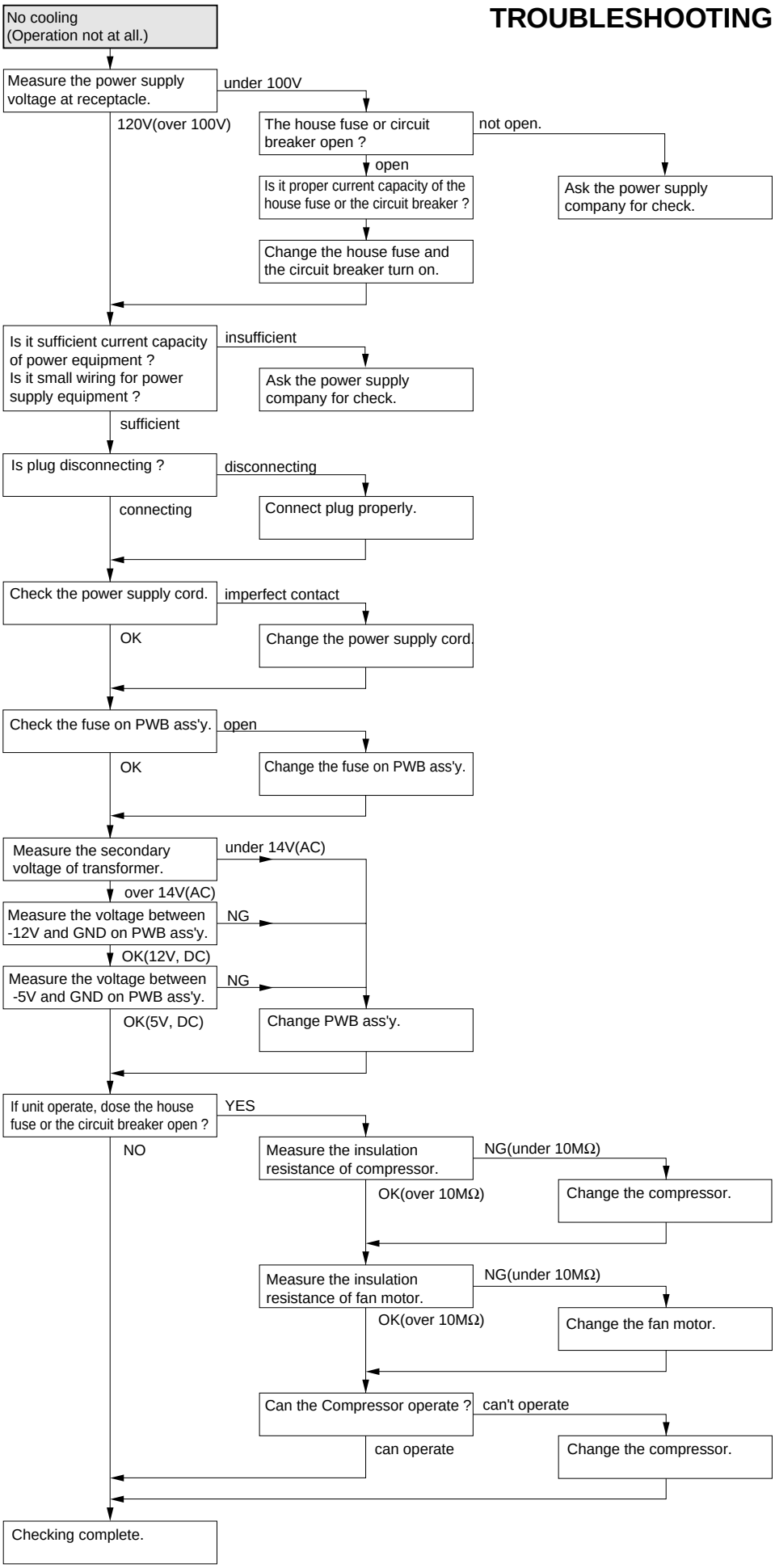

CA1: 1000pF x 8 (CAPACITOR ARRAY)
RA1: 10kΩ x 8 (RESISTOR ARRAY)

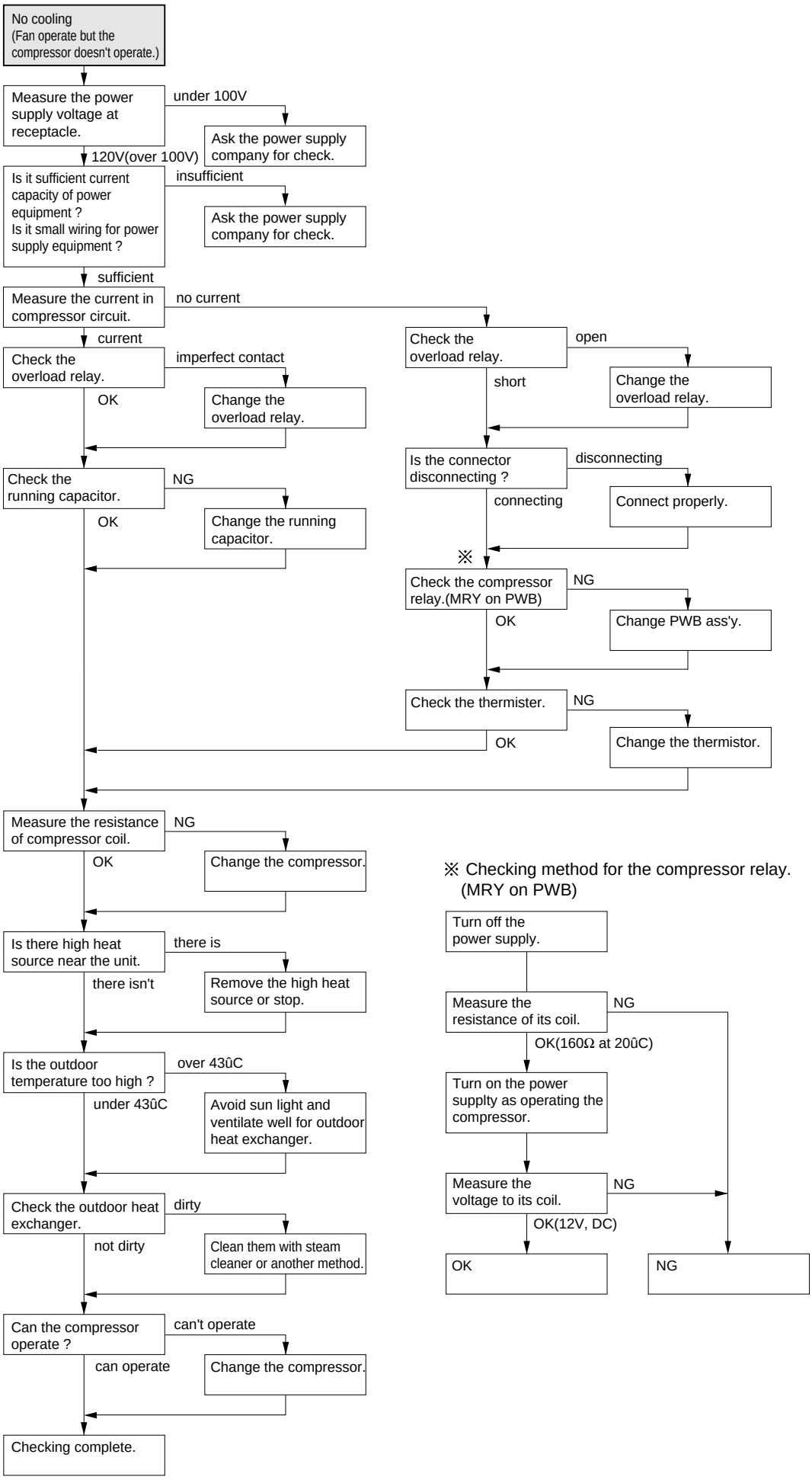
IF NOT SPECIFIED 1/5W, ±5% (RESISTOR)
IF NOT SPECIFIED 50V 1000pF (CAPACITOR)
IF NOT SPECIFIED 1SS133T-72 (DIODE)
△ : INDICATED POSITION IS FUNCTION TEST POINT

## Electronic Control Circuit Diagram

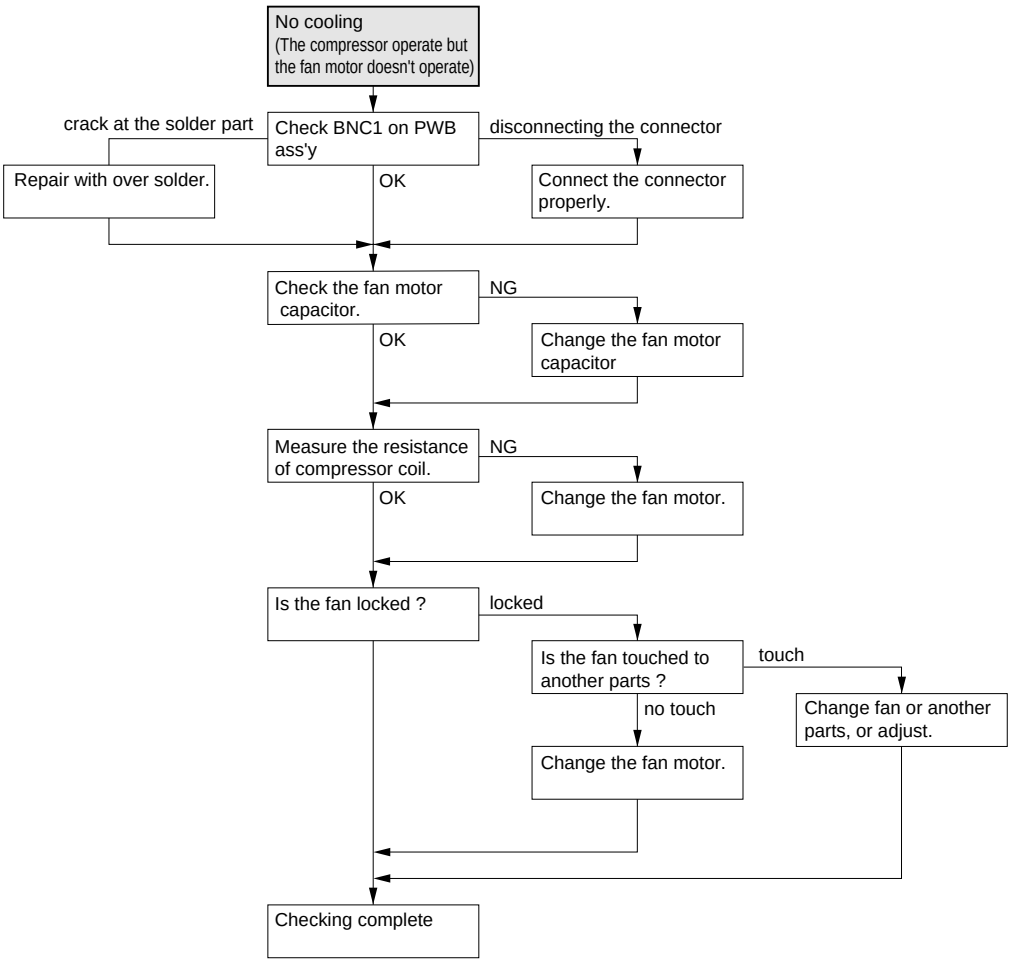
**Printed Wiring Board**

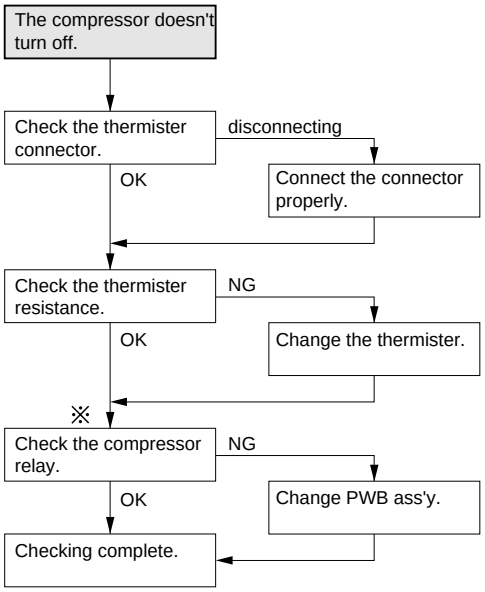
# TROUBLESHOOTING GUIDE


No cooling
(Operation not at all.)
Measure the power supply voltage at receptacle.
under 100V
120V(over 100V)
The house fuse or circuit breaker open ?
not open.
open
Ask the power supply company for check.
Is it proper current capacity of the house fuse or the circuit breaker ?
Change the house fuse and the circuit breaker turn on.
Is it sufficient current capacity of power equipment ?
Is it small wiring for power supply equipment ?
insufficient
Ask the power supply company for check.
sufficient
Is plug disconnecting ?
disconnecting
connecting
Connect plug properly.
Check the power supply cord.
imperfect contact
OK
Change the power supply cord.
Check the fuse on PWB ass'y.
open
OK
Change the fuse on PWB ass'y.
Measure the secondary voltage of transformer.
under 14V(AC)
over 14V(AC)
Measure the voltage between -12V and GND on PWB ass'y.
NG
OK(12V, DC)
Measure the voltage between -5V and GND on PWB ass'y.
NG
OK(5V, DC)
Change PWB ass'y.
If unit operate, dose the house fuse or the circuit breaker open ?
YES
NO
Measure the insulation resistance of compressor.
NG(under 10MΩ)
OK(over 10MΩ)
Change the compressor.
Measure the insulation resistance of fan motor.
NG(under 10MΩ)
OK(over 10MΩ)
Change the fan motor.
Can the Compressor operate ?
can't operate
can operate
Change the compressor.
Checking complete.

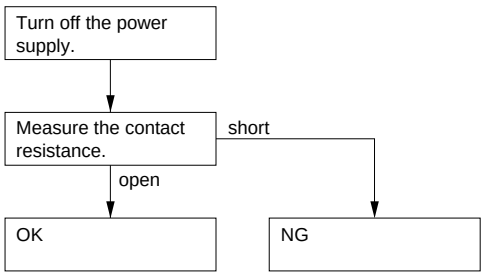


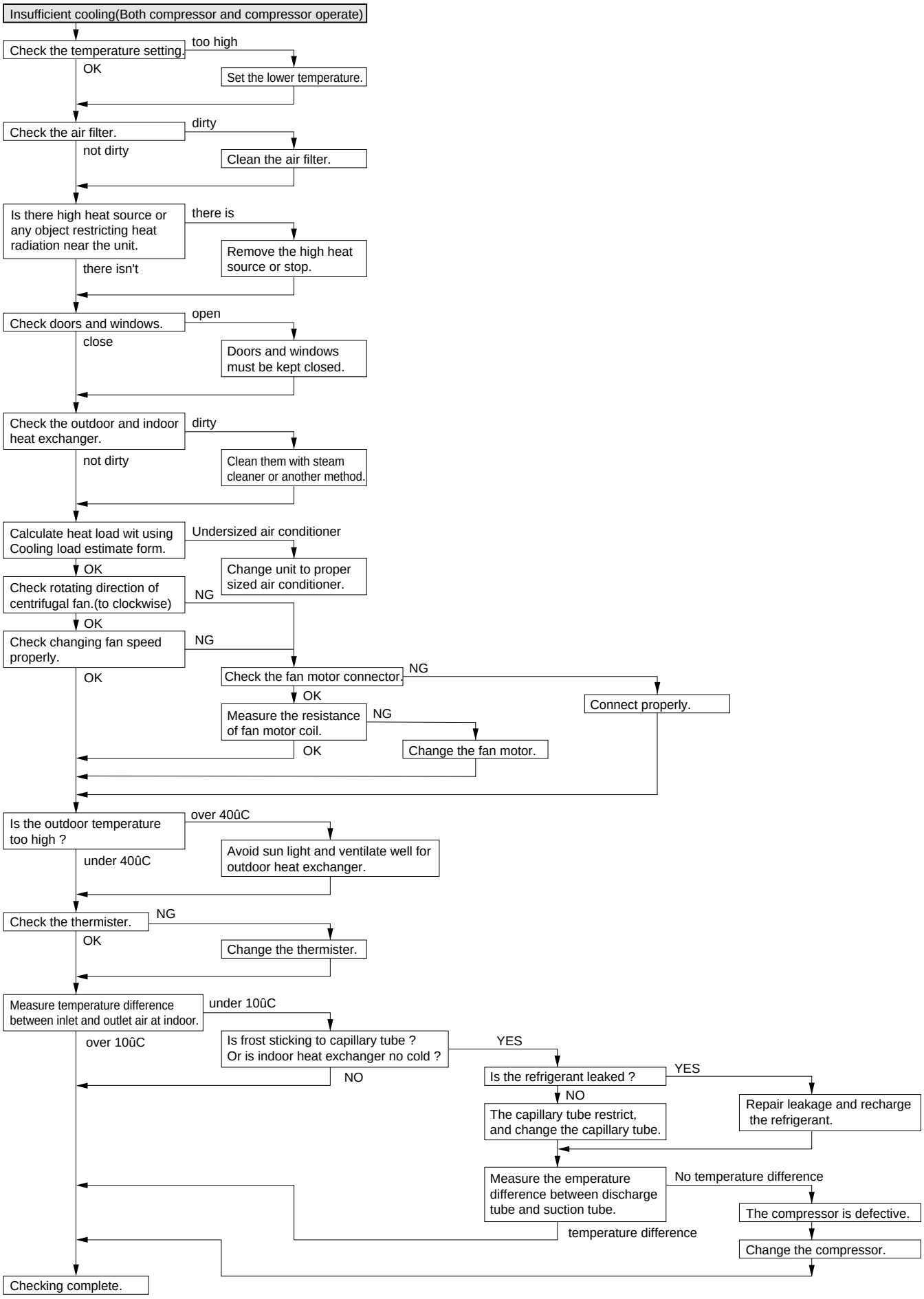

※ Checking method for the compressor relay. (MRY on PWB)

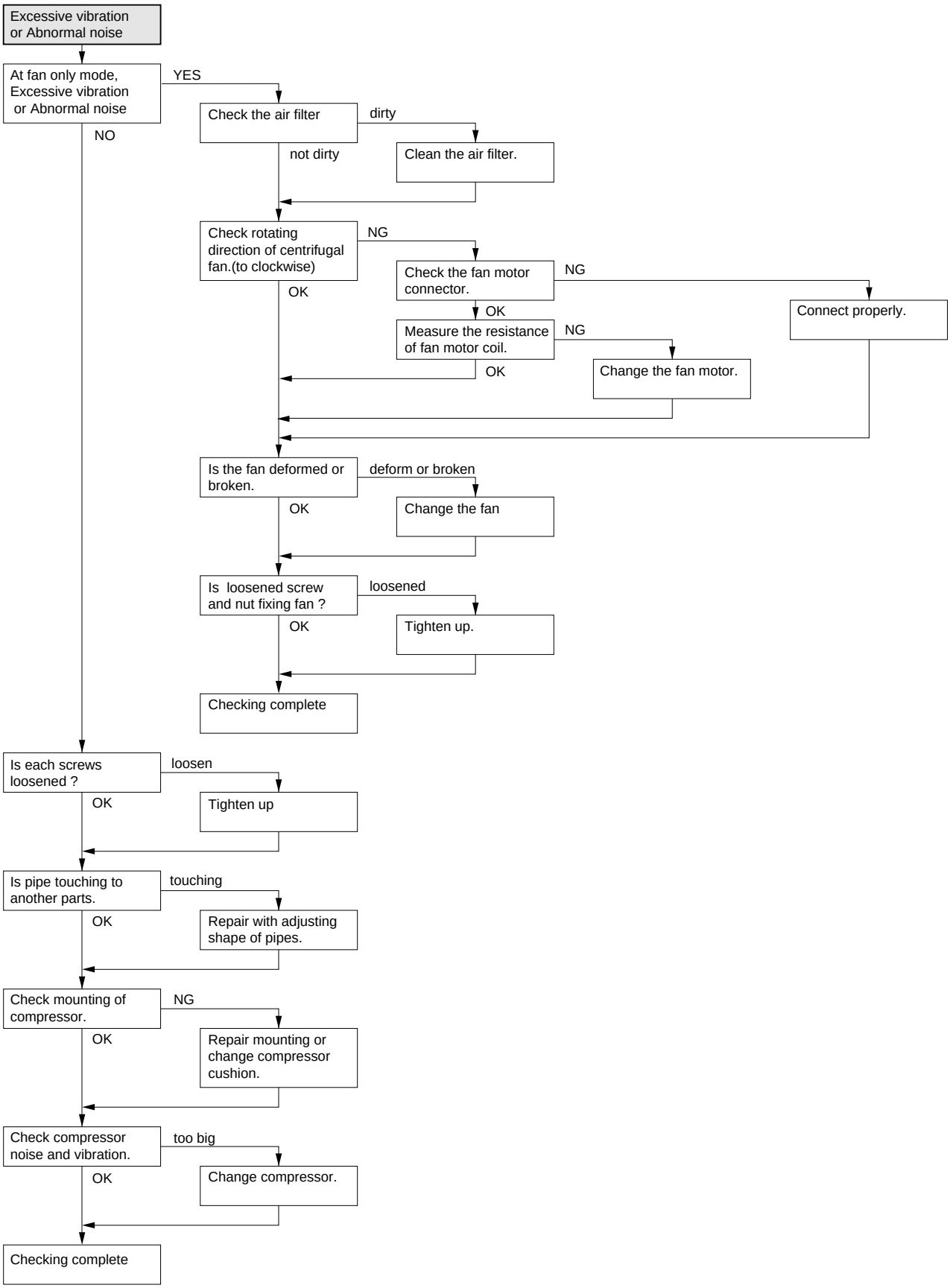



※ Checking method for the compressor relay. (MRY and PWB)




Insufficient cooling(Both compressor and compressor operate)
Check the temperature setting.
too high
Set the lower temperature.
OK
Check the air filter.
dirty
Clean the air filter.
not dirty
Is there high heat source or any object restricting heat radiation near the unit.
there is
Remove the high heat source or stop.
there isn't
Check doors and windows.
open
Doors and windows must be kept closed.
close
Check the outdoor and indoor heat exchanger.
dirty
Clean them with steam cleaner or another method.
not dirty
Calculate heat load wit using Cooling load estimate form.
Undersized air conditioner
Change unit to proper sized air conditioner.
OK
Check rotating direction of centrifugal fan.(to clockwise)
NG
OK
Check changing fan speed properly.
NG
OK
Check the fan motor connector.
NG
Connect properly.
OK
Measure the resistance of fan motor coil.
NG
Change the fan motor.
OK
Is the outdoor temperature too high ?
over 40ûC
Avoid sun light and ventilate well for outdoor heat exchanger.
under 40ûC
Check the thermister.
NG
Change the thermister.
OK
Measure temperature difference between inlet and outlet air at indoor.
under 10ûC
Is frost sticking to capillary tube ?
Or is indoor heat exchanger no cold ?
YES
NO
Is the refrigerant leaked ?
YES
NO
Repair leakage and recharge the refrigerant.
The capillary tube restrict, and change the capillary tube.
over 10ûC
Measure the emperature difference between discharge tube and suction tube.
No temperature difference
The compressor is defective.
temperature difference
Change the compressor.
Checking complete.


Excessive vibration or Abnormal noise
At fan only mode, Excessive vibration or Abnormal noise
YES
NO
Check the air filter
dirty
Clean the air filter.
not dirty
Check rotating direction of centrifugal fan.(to clockwise)
NG
Check the fan motor connector.
NG
Connect properly.
OK
OK
Measure the resistance of fan motor coil.
NG
Change the fan motor.
OK
Is the fan deformed or broken.
deform or broken
Change the fan
OK
Is loosened screw and nut fixing fan ?
loosened
Tighten up.
OK
Checking complete
Is each screws loosened ?
loosen
Tighten up
OK
Is pipe touching to another parts.
touching
Repair with adjusting shape of pipes.
OK
Check mounting of compressor.
NG
Repair mounting or change compressor cushion.
OK
Check compressor noise and vibration.
too big
Change compressor.
OK
Checking complete

# COOLING LOAD ESTIMATE FORM

**INSTRUCTIONS FOR USING COOLING LOAD ESTIMATE FORM FOR ROOM AIR CONDITIONERS**
(AHAM PUB. NO. RAC-1)

A. This cooling load estimate form is suitable for estimating the cooling load for comfort air conditioning installations which do not require specific conditions of inside temperature and humidity.

B. The form is based on an outside design temperature of 95˚F dry bulb and 75˚F wet bulb. It can be used for areas in the continental United States having other outside design temperature by applying a correction factor for the particular locality as determined from the map.

C. The form includes "day" factors for calculating cooling loads in rooms where daytime comfort (such as living rooms, offices, etc.).

D. The numbers of the following paragraphs refer to the correspondingly numbered item on the form:

1. Multiply the square feet of window area for each exposure by the applicable factor. The window area is the area of the wall opening in which the window is installed. For windows shaded by inside shades or venetian blinds, use the factor for "Inside Shades". For windows shades by outside awnings or by both outside awnings and inside shades (or venetian blinds), use the factor for "Outside Awnings". "Single Glass" includes all types of single thickness windows, and "Double Glass" includes sealed air space types, storm windows, and glass block. Only one number should be entered in the right-hand column for item 1, and this number should represent only the exposure with the largest load.

2. Multiply the total square feet of all windows in the room by the applicable factor.

3a. Multiply the total length (linear feet) of all walls exposed to the outside by the applicable factor. Doors should be considered as being part of the wall. Outside walls facing due north should be calculated separately from outside walls facing other directions. Walls which are permanently shaded by adjacent structures should be considered as being "North Exposure". Do not consider trees and shrubbery as providing permanent shading. An insulated frame wall or a masonry wall 8 inches or less in thickness is considered "Light Construction". An insulated frame wall or a masonry wall over 8 inches in thickness is considered "Heavy Construction".

3b. Multiply the total length (linear feet) of all inside walls between the space to be conditioned and any unconditioned spaces by the given factor. Do not include inside walls which separate other air conditioned rooms.

4. Multiply the total square feet of roof or ceiling area by the factor given for the type of construction most nearly describing the particular application. (Use one line only.)

5. Multiply the total square feet of floor area by the factor given. Disregard this item if the floor is directly on the ground or over a basement.

6. Multiply the number of people who normally occupy the space to be air conditioned by the factory given. Use a minimum of 2 people.

7. Determine the total number of watts for lights and electrical equipment, except the air conditioner itself, that will be in use when the room air conditioning is operating. Multiply the total wattage by the factor given.

8. Multiply the total width (linear feet) of any doors or arches which are continually open to an unconditioned space by the applicable factor.
   NOTE: Where the width of the doors or arches is more than 5 feet, the actual load may exceed the calculated value. In such cases, both adjoining rooms should be considered as a single large room, and the room air conditioner unit or units should be selected according to a calculation made on this new basis.

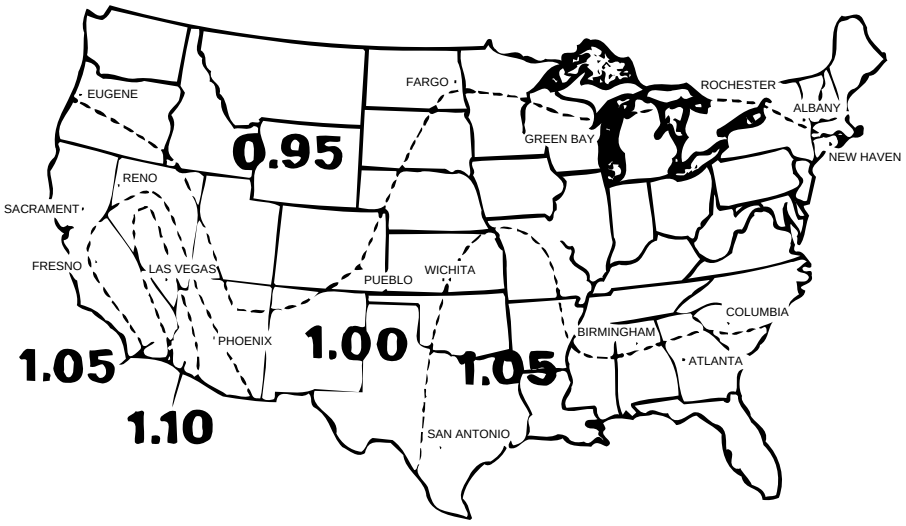
9. Total the loads estimated for the foregoing 8 items.

10. Multiply the sub total obtained in item 9 by the proper correction factor, selected from the map, for the particular locality. The result is the total estimated design cooling load in BTU per hour.

E. For best results a room air conditioner unit or units having a cooling capacity rating (determined in accordance with the NEMA Standards Publication for Room Air Conditioners, CN 1-1960) as close as possible to the estimated load should be selected. In general, a greatly oversized unit which would operate intermittently will be much less satisfactory than one which is slightly undersized and which would operate more nearly continuously.

F. Intermittent loads such as kitchen and laundry equipment are not included in this form.

| HEAT GAIN FROM | QUANTITY | FACTORS — DAY: No Shades | Inside Shades | Outside Shades | (Area a Factor) | BTU/Hr (Quantity x Factor) |
|---|---|---|---|---|---|---|
| 1. WINDOWS: Heat gain from sun. | | | | | | |
| Northeast | _____ sq ft | 60 | 25 | 20 | _____ | Use _____ |
| Southeast | _____ sq ft | 80 | 40 | 25 | _____ | only _____ |
| South | _____ sq ft | 75 | 30 | 20 | _____ | the _____ |
| Southwest | _____ | 75 | 35 | 20 | _____ | largest _____ |
| Southeast | _____ sq ft | 110 | 45 | 30 | _____ | load _____ |
| West | _____ sq ft | 150 | 65 | 45 | _____ | Use _____ |
| Northwest | _____ sq ft | 120 | 50 | 35 | _____ | only _____ |
| North | _____ sq ft | 0 | 0 | 0 | _____ | only _____ |
| | These factors are for single glass only. For glass block, multiply the above factors by 0.5: for double-glass or storm windows, multiply the above factors by 0.8. | | | | | |
| 2. WINDOWS: Heat gain by conduction. (Total of all windows) | | | | | | |
| Single glass | _____ sq ft | | | 14 | | _____ |
| Double glass or glass block | _____ sq ft | | | 7 | | _____ |
| 3. WALLS: (Based on linear feet of wall.) | | | Light Construction | | Heavy Construction | |
| a. Outside walls | | | | | | |
| Noth exposure | _____ ft | | 30 | | 20 | _____ |
| Other than North exposure | _____ ft | | 60 | | 30 | _____ |
| b. Inside Walls (between conditioned and unconditioned spaces only) | _____ ft | | | 30 | | _____ |
| 4. ROOF OR CEILING: (Use one only.) | | | | | | |
| a. Roof, uninsulated | _____ sq ft | | | 19 | | _____ |
| b. Roof, 1 inch or more insulation | _____ sq ft | | | 8 | | _____ |
| c. Ceiling, occupied space above. | _____ sq ft | | | 3 | | _____ |
| d. Ceiling, insulated with attic space above | _____ sq ft | | | 5 | | _____ |
| e. Ceiling, uninsulated, with attic space above | _____ sq ft | | | 12 | | _____ |
| 5. FLOOR: (Disregard if floor is directly on ground or over basement.) | _____ sq ft | | | 3 | | _____ |
| 6. NUMBER OF PEOPLE: | | | | 600 | | |
| 7. LIGHTS AND ELECTRICAL EQUIPMENT IN USE | _____ watts | | | 3 | | _____ |
| 8. DOORS AND ARCHES CONTINUOUSLY OPENED TO UNCONDITIONED SPACE: (Linear feet of width.) | _____ ft | | | 300 | | _____ |
| 9. SUB-TOTAL | x x x x x | | | x x x x x | | |
| 10. TOTAL COOLING LOAD: (BTU per hour to be used for selection of room air conditioner(s).) | _____ | (Item 9) x _____ | | (Factor from Map) = | | _____ |



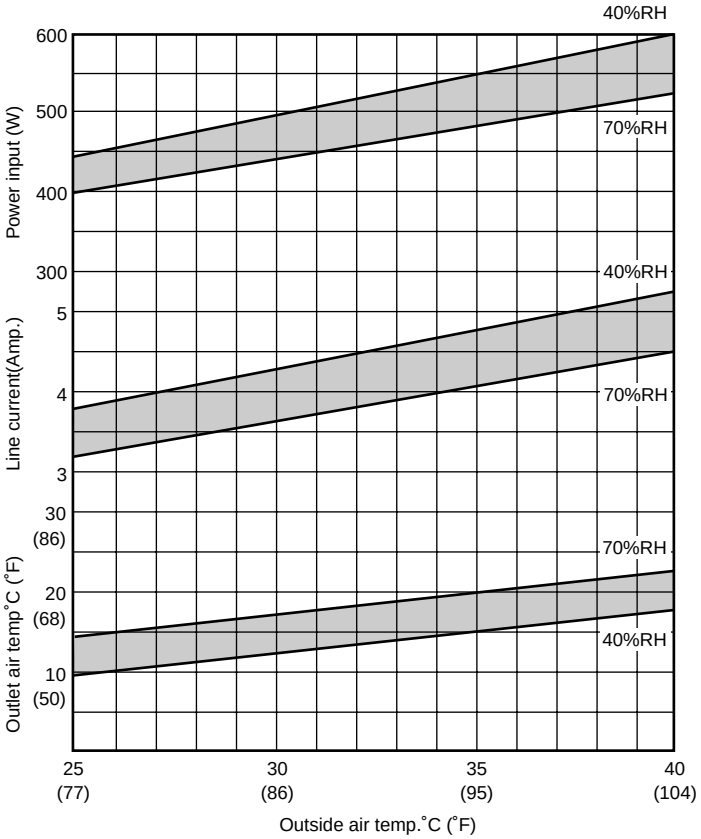
# RUNNING CONDITION

Note:

1. Select mode of the Running Condition of a Room Air Conditioner.
   SELECTOR ..... HIGH COOL
   THERMOSTAT ..... 64˚F
2. Data of Performance Curve is measured between 40%RH and 70%RH.
   If you measure the Room Air Conditioner above or below this rating, the data may miss the range of the performance curve.
3. Outlet air temp. is influenced by the method of measurement. Measurement examples are shown.
4. Use power input data when checking the Running Condition.

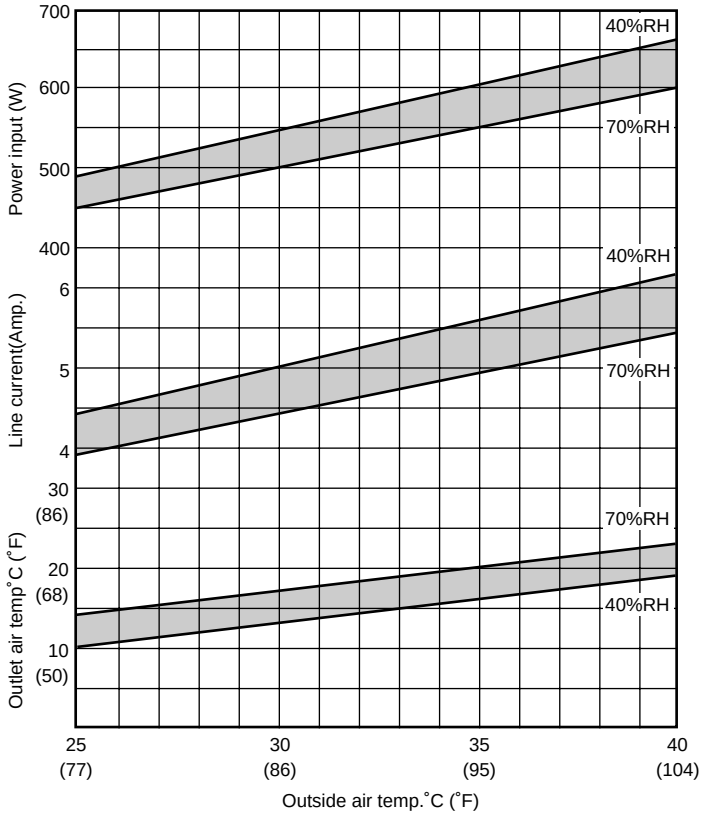
## RUNNING CONDITION FOR MODEL AF-R50CX / AF-R55CX

### PERFORMANCE CURVE



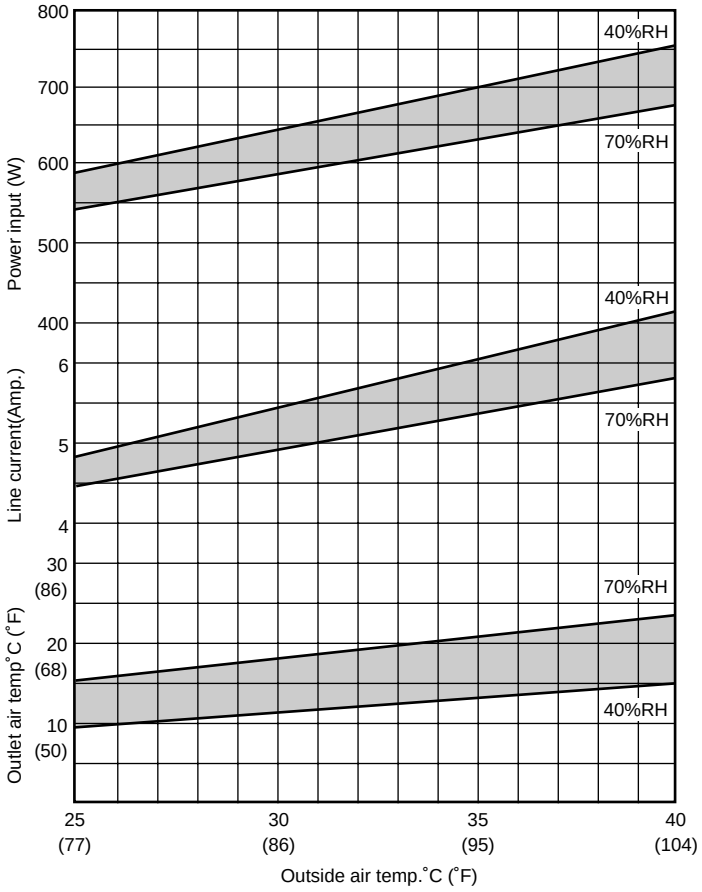

## RUNNING CONDITION FOR MODEL AF-R60CX

### PERFORMANCE CURVE

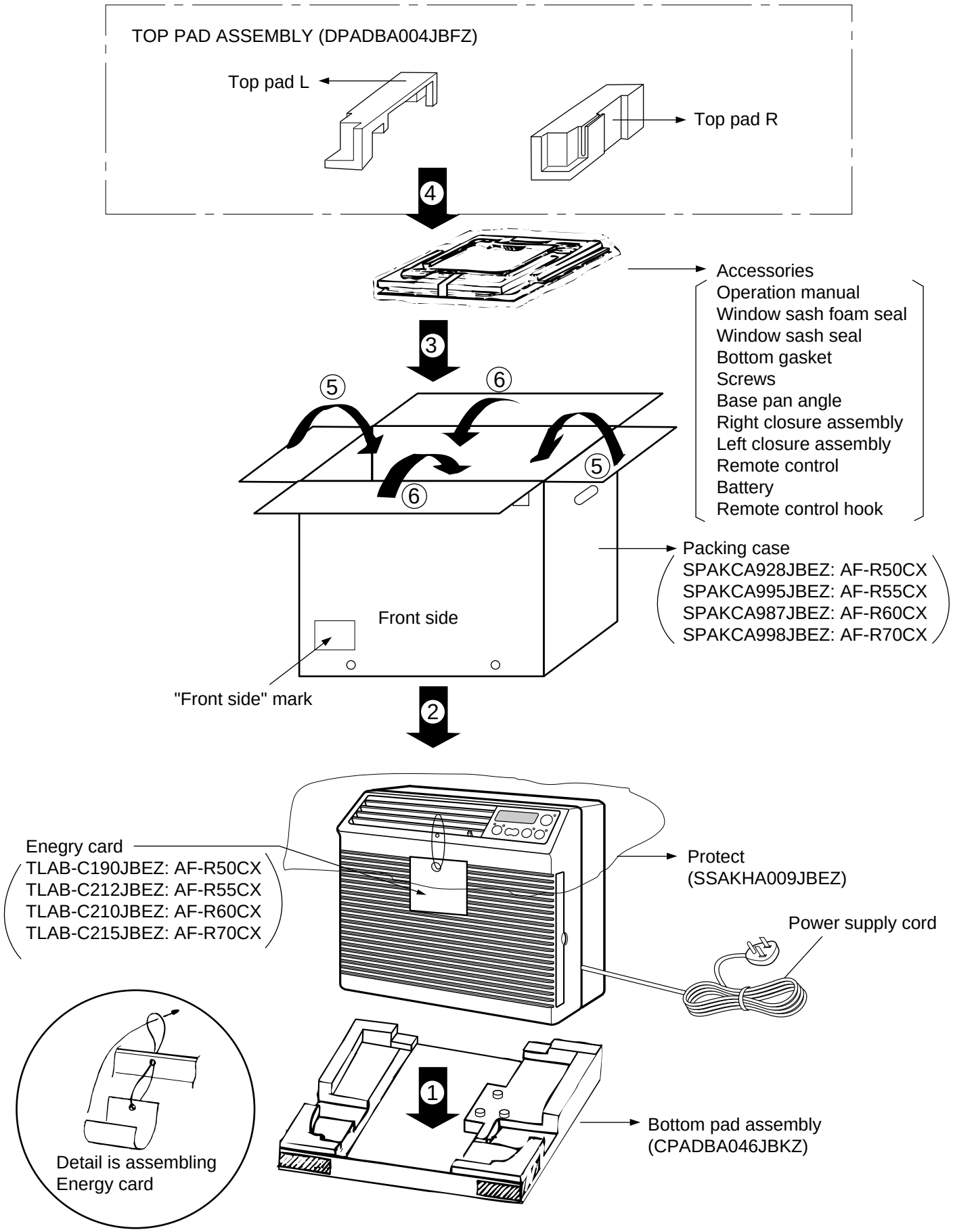


## RUNNING CONDITION FOR MODEL AF-R70CX

### PERFORMANCE CURVE



# PACKING AND ACCESSORIES



# REPLACEMENT PARTS LIST

| REF. NO. | PART NO. | DESCRIPTION | Q'TY | CODE |
|---|---|---|---|---|
| | **CABINET AND UNIT PARTS** | | | |
| 1- 1 | DCHS-A439JBTA | Base pan ass'y [AF-R50CX] | 1 | AZ |
| 1- 1 | DCHS-A439JBTA | Base pan ass'y [AF-R55CX] | 1 | AZ |
| 1- 1 | DCHS-A439JBTA | Base pan ass'y [AF-R70CX] | 1 | AZ |
| 1- 1 | DCHS-A441JBTA | Base pan ass'y [AF-R60CX] | 1 | BA |
| 1- 2 | CCAB-A316JBKZ | Cabinet ass'y | 1 | BB |
| 1- 3 | LANG-A503JBTA | Top inst. angle | 1 | BP |
| 1- 4 | PSEL-C357JBEZ | Cabinet insulator | 1 | AC |
| 1- 5 | HPNLCA802JBFA | Control panel [AF-R50CX] | 1 | AE |
| 1- 5 | HPNLCA802JBFA | Control panel [AF-R60CX] | 1 | AE |
| 1- 5 | HPNLCA802JBFA | Control panel [AF-R70CX] | 1 | AE |
| 1- 5 | HPNLCA802JBFB | Control panel [AF-R55CX] | 1 | AE |
| 1- 6 | HPNLCA803JBEA | Key sheet [AF-R50CX] | 1 | AM |
| 1- 6 | HPNLCA803JBEA | Key sheet [AF-R60CX] | 1 | AM |
| 1- 6 | HPNLCA803JBEA | Key sheet [AF-R70CX] | 1 | AM |
| 1- 6 | HPNLCA810JBEA | Key sheet [AF-R55CX] | 1 | AN |
| 1- 7 | PKESPA091JBFZ | Condenser shroud | 1 | AS |
| 1- 8 | PSEL-C351JBEZ | Condenser indulator | 1 | AC |
| 1- 9 | NFANPA106JBFZ | Propeller fan | 1 | AR |
| 1-10 | CMOTLA998JBEZ | Fan motor | 1 | BK |
| 1-11 | PSEL-A828JBE0 | Motor insulator | 1 | AB |
| 1-12 | PSKR-A239JBFA | Bulkhead | 1 | AX |
| 1-13 | PKESSA067JBFZ | Caseing | 1 | AH |
| 1-14 | NFANSA027JBF0 | Centrifugal fan | 1 | AU |
| 1-15 | PKESSA066JBFA | Orifice [AF-R50CX] | 1 | AH |
| 1-15 | PKESSA066JBFA | Orifice [AF-R60CX] | 1 | AH |
| 1-15 | PKESSA066JBFA | Orifice [AF-R70CX] | 1 | AH |
| 1-15 | PKESSA066JBFB | Orifice [AF-R55CX] | 1 | AR |
| 1-16 | MLOV-A321JBFA | Vertical louver A [AF-R50CX] | 1 | AC |
| 1-16 | MLOV-A321JBFA | Vertical louver A [AF-R60CX] | 1 | AC |
| 1-16 | MLOV-A321JBFA | Vertical louver A [AF-R70CX] | 1 | AC |
| 1-16 | MLOV-A321JBFB | Vertical louver A [AF-R55CX] | 1 | AC |
| 1-17 | MLOV-A322JBFA | Vertical louver B [AF-R50CX] | 3 | AC |
| 1-17 | MLOV-A322JBFA | Vertical louver B [AF-R60CX] | 3 | AC |
| 1-17 | MLOV-A322JBFA | Vertical louver B [AF-R70CX] | 3 | AC |
| 1-17 | MLOV-A322JBFB | Vertical louver B [AF-R55CX] | 3 | AC |
| 1-18 | MJNTPA089JBFA | Louver joint [AF-R50CX] | 1 | AC |
| 1-18 | MJNTPA089JBFA | Louver joint [AF-R60CX] | 1 | AC |
| 1-18 | MJNTPA089JBFA | Louver joint [AF-R70CX] | 1 | AC |
| 1-18 | MJNTPA089JBFB | Louver joint [AF-R55CX] | 1 | AC |
| 1-19 | MLOV-A323JBFA | Horizontal louver [AF-R50CX] | 4 | AC |
| 1-19 | MLOV-A323JBFA | Horizontal louver [AF-R60CX] | 4 | AC |
| 1-19 | MLOV-A323JBFA | Horizontal louver [AF-R70CX] | 4 | AC |
| 1-19 | MLOV-A323JBFB | Horizontal louver [AF-R55CX] | 4 | AC |
| 1-20 | MJNTPA090JBFA | Louver link [AF-R50CX] | 1 | AC |
| 1-20 | MJNTPA090JBFA | Louver link [AF-R60CX] | 1 | AC |
| 1-20 | MJNTPA090JBFA | Louver link [AF-R70CX] | 1 | AC |
| 1-20 | MJNTPA090JBFB | Louver link [AF-R55CX] | 1 | AC |
| 1-21 | MSPR-A148JBEZ | Louver spring | 2 | AF |
| 1-22 | GWAKPA150JBFA | Front panel [AF-R50CX] | 1 | AV |
| 1-22 | GWAKPA150JBFA | Front panel [AF-R60CX] | 1 | AV |
| 1-22 | GWAKPA150JBFA | Front panel [AF-R70CX] | 1 | AV |
| 1-22 | GWAKPA150JBFB | Front panel [AF-R55CX] | 1 | AV |
| 1-23 | PFILMA162JBEA | Air filter [AF-R50CX] | 1 | AK |
| 1-23 | PFILMA162JBEA | Air filter [AF-R60CX] | 1 | AK |
| 1-23 | PFILMA162JBEA | Air filter [AF-R70CX] | 1 | AK |
| 1-23 | PFILMA162JBEB | Air filter [AF-R55CX] | 1 | AK |
| 1-24 | PSEL-C254JBEZ | Tube insulator | 1 | AC |
| 1-25 | LHLDW0364JBE0 | Wire holder | 1 | AA |
| 1-26 | LHLDW0366JBE0 | Wire holder [AF-R50CX] | 1 | AA |
| 1-26 | LHLDW0366JBE0 | Wire holder [AF-R60CX] | 1 | AA |
| 1-26 | LHLDW0366JBE0 | Wire holder [AF-R70CX] | 1 | AA |
| 1-26 | LHLDW0366JBE0 | Wire holder [AF-R60CX] | 2 | AA |
| 1-27 | TSPC-E006JBRZ | Name badge [AF-R50CX] | 1 | AC |
| 1-27 | TSPC-E072JBRZ | Name badge [AF-R55CX] | 1 | AC |
| 1-27 | TSPC-E062JBRZ | Name badge [AF-R60CX] | 1 | AC |
| 1-27 | TSPC-E075JBRZ | Name badge [AF-R70CX] | 1 | AC |
| 1-28 | TLAB-C190JBEZ | Energy card [AF-R50CX] | 1 | AC |
| 1-28 | TLAB-C212JBEZ | Energy card [AF-R55CX] | 1 | AC |
| 1-28 | TLAB-C210JBEZ | Energy card [AF-R60CX] | 1 | AC |

| REF. NO. | PART NO. | DESCRIPTION | Q'TY | CODE |
|---|---|---|---|---|
| 1-28 | TLAB-C215JBEZ | Energy card [AF-R70CX] | 1 | AC |
| 1-29 | TLABBA110JBRA | Sharp badge | 1 | AB |
| 1-30 | TLABKA564JBE0 | Number card | 1 | AC |
| 1-31 | TLABMA309JBRZ | Feature card | 1 | AD |
| 1-32 | LBND-A042JBE0 | Wire fixing band | 2 | AC |
| 1-33 | DSKR-A126JBKZ | Bulkhead ass'y | 1 | AW |
| 1-34 | DKES-A029JBKZ | Orifice ass'y [AF-R50CX] | 1 | AW |
| 1-34 | DKES-A029JBKZ | Orifice ass'y [AF-R60CX] | 1 | AW |
| 1-34 | DKES-A029JBKZ | Orifice ass'y [AF-R70CX] | 1 | AW |
| 1-34 | DKES-A030JBKZ | Orifice ass'y [AF-R55CX] | 1 | AV |

## CONTROL BOX PARTS

| | | | | |
|---|---|---|---|---|
| 2- 1 | DPLT-A057JBWZ | Cont. box cover ass'y | 1 | AH |
| 2- 2 | DPLT-A058JBWZ | Cont. box angle ass'y | 1 | AM |
| 2- 3 | LBNDKA104JBWZ | Capacitor clamp | 1 | AG |
| 2- 4 | QACC-A260JBZZ | Power supply cord | 1 | AS |
| 2- 5 | RH-HXA006JBZZ | Thermistor | 1 | AK |
| 2- 6 | QW-VZC561JBE0 | Lead wire | 1 | AD |
| 2- 7 | RC-HZA256JBE0 | Fan motor capacitor | 1 | AM |
| 2- 8 | RC-HZA418JBZZ | Running capacitor [AF-R50CX] | 1 | AV |
| 2- 8 | RC-HZA418JBZZ | Running capacitor [AF-R60CX] | 1 | AV |
| 2- 8 | RC-HZA418JBZZ | Running capacitor [AF-R70CX] | 1 | AV |
| 2- 8 | RC-HZA393JBE0 | Running capacitor [AF-R60CX] | 1 | AW |
| 2- 9 | TLABCB552JBRZ | Wiring diagram [AF-R50CX] | 1 | AA |
| 2- 9 | TLABCB552JBRZ | Wiring diagram [AF-R55CX] | 1 | AA |
| 2- 9 | TLABCB552JBRZ | Wiring diagram [AF-R70CX] | 1 | AA |
| 2- 9 | TLABCB582JBRZ | Wiring diagram [AF-R60CX] | 1 | AA |
| 2-10 | DPWBFA244JBKZ | Control board unit | 1 | BF |
| 2-11 | PSPA-A158JBZZ | PWB Spacer | 2 | AD |
| 2-12 | PSPA-A159JBZZ | PWB Spacer | 1 | AD |
| 2-13 | QFS-AA048JBE0 | Fuse | 1 | AB |
| 2-14 | LBND-A042JBE0 | Wire fixing band | 3 | AC |
| 2-15 | QW-IZA030JBZZ | Comp. wiring [AF-R50CX] | 1 | AT |
| 2-15 | QW-IZA030JBZZ | Comp. wiring [AF-R55CX] | 1 | AT |
| 2-15 | QW-IZA030JBZZ | Comp. wiring [AF-R70CX] | 1 | AT |
| 2-15 | QW-IZA038JBZZ | Comp. wiring [AF-R60CX] | 1 | AS |
| 2-16 | PPLT-A299JBEZ | Insulator sheet | 1 | AG |
| 2-17 | PPLT-A301JBEZ | Insulator sheet | 1 | AA |

## CYCLE PARTS

| | | | | |
|---|---|---|---|---|
| 3- 1 | PCMPRA319JBEZ | Compressor [AF-R50CX] | 1 | BZ |
| 3- 1 | PCMPRA319JBEZ | Compressor [AF-R55CX] | 1 | BZ |
| 3- 1 | PCMPRA362JBEZ | Compressor [AF-R60CX] | 1 | BZ |
| 3- 1 | PCMPRA323JBEZ | Compressor [AF-R70CX] | 1 | BZ |
| 3- 2 | GLEG-A089JBE0 | Compressor cushion [AF-R50CX] | 3 | AR |
| 3- 2 | GLEG-A089JBE0 | Compressor cushion [AF-R55CX] | 3 | AR |
| 3- 2 | GLEG-A089JBE0 | Compressor cushion [AF-R70CX] | 3 | AR |
| 3- 2 | GLEG-A103JBE0 | Compressor cushion [AF-R60CX] | 3 | AG |
| 3- 3 | PPIPCF488JB1Z | Discharge tube [AF-R50CX] | 1 | AM |
| 3- 3 | PPIPCF488JB1Z | Discharge tube [AF-R55CX] | 1 | AM |
| 3- 3 | PPIPCF488JB1Z | Discharge tube [AF-R60CX] | 1 | AM |
| 3- 3 | PPIPCF683JB1Z | Discharge tube [AF-R70CX] | 1 | AM |
| 3- 4 | PCON-A473JBEZ | Condenser [AF-R50CX] | 1 | BG |
| 3- 4 | PCON-A473JBEZ | Condenser [AF-R55CX] | 1 | BG |
| 3- 4 | PCON-A473JBEZ | Condenser [AF-R60CX] | 1 | BG |
| 3- 4 | PCON-A485JBEZ | Condenser [AF-R70CX] | 1 | BQ |
| 3- 5 | PPIPCF491JB1Z | Lead tube | 1 | AF |
| 3- 6 | DCPY-A258JBKZ | Capillary tube ass'y [AF-R50CX] | 1 | AR |
| 3- 6 | DCPY-A258JBKZ | Capillary tube ass'y [AF-R55CX] | 1 | AR |
| 3- 6 | DCPY-A273JBKZ | Capillary tube ass'y [AF-R60CX] | 1 | AV |
| 3- 6 | DCPY-A276JBKZ | Capillary tube ass'y [AF-R70CX] | 1 | AR |
| 3- 7 | PEVA-A454JBEZ | Evaporator [AF-R50CX] | 1 | BD |
| 3- 7 | PEVA-A454JBEZ | Evaporator [AF-R55CX] | 1 | BD |
| 3- 7 | PEVA-A461JBEZ | Evaporator [AF-R60CX] | 1 | BM |
| 3- 7 | PEVA-A464JBEZ | Evaporator [AF-R70CX] | 1 | BD |
| 3- 8 | CPIP-A027JBKZ | Suction tube ass'y [AF-R50CX] | 1 | AR |
| 3- 8 | CPIP-A027JBKZ | Suction tube ass'y [AF-R55CX] | 1 | AR |
| 3- 8 | CPIP-A026JBKZ | Suction tube ass'y [AF-R60CX] | 1 | AV |
| 3- 8 | CPIP-A025JBKZ | Suction tube ass'y [AF-R70CX] | 1 | AV |
| 3- 9 | PSEL-B183JBE0 | Terminal gasket [AF-R50CX] | 1 | AC |
| 3- 9 | PSEL-B183JBE0 | Terminal gasket [AF-R55CX] | 1 | AC |
| 3- 9 | PSEL-B183JBE0 | Terminal gasket [AF-R70CX] | 1 | AC |
| 3- 9 | PSEL-B160JBE0 | Terminal gasket [AF-R60CX] | 1 | AH |

| REF. NO. | PART NO. | DESCRIPTION | Q'TY | CODE |
|---|---|---|---|---|
| 3-10 | RHOG-A177JBZZ | Overload relay [AF-R50CX] | 1 | AW |
| 3-10 | RHOG-A177JBZZ | Overload relay [AF-R55CX] | 1 | AW |
| 3-10 | RHOG-A200JBZZ | Overload relay [AF-R60CX] | 1 | AU |
| 3-10 | RHOG-A181JBZZ | Overload relay [AF-R70CX] | 1 | AU |
| 3-11 | MSPR-A117JBE0 | Protector spring [AF-R50CX] | 1 | AE |
| 3-11 | MSPR-A117JBE0 | Protector spring [AF-R55CX] | 1 | AE |
| 3-11 | MSPR-A117JBE0 | Protector spring [AF-R70CX] | 1 | AE |
| 3-11 | MSPR-A114JBE0 | Protector spring [AF-R60CX] | 1 | AF |
| 3-12 | PCOV-A382JBE0 | Terminal cover [AF-R50CX] | 1 | AE |
| 3-12 | PCOV-A382JBE0 | Terminal cover [AF-R55CX] | 1 | AE |
| 3-12 | PCOV-A382JBE0 | Terminal cover [AF-R70CX] | 1 | AE |
| 3-12 | PCOV-A371JBE0 | Terminal cover [AF-R60CX] | 1 | AF |
| 3-13 | PSEL-A691JBE0 | Gasket washer [AF-R50CX] | 1 | AF |
| 3-13 | PSEL-A691JBE0 | Gasket washer [AF-R55CX] | 1 | AF |
| 3-13 | PSEL-A691JBE0 | Gasket washer [AF-R70CX] | 1 | AF |
| 3-13 | PSEL-B161JBE0 | Gasket washer [AF-R60CX] | 1 | AH |
| 3-14 | PGUM-A113JBE0 | Damper rubber [AF-R50CX] | 1 | AH |
| 3-14 | PGUM-A113JBE0 | Damper rubber [AF-R55CX] | 1 | AH |
| 3-14 | PGUM-A113JBE0 | Damper rubber [AF-R70CX] | 1 | AH |
| 3-15 | LBND-A046JBE0 | Wire fixing band [AF-R50CX] | 1 | AE |
| 3-15 | LBND-A046JBE0 | Wire fixing band [AF-R55CX] | 1 | AE |
| 3-15 | LBND-A046JBE0 | Wire fixing band [AF-R70CX] | 1 | AE |
| 3-16 | LHLD-A315JBF0 | Thermistor holder [AF-R50CX] | 1 | AE |
| 3-16 | LHLD-A315JBF0 | Thermistor holder [AF-R55CX] | 1 | AE |
| 3-16 | LHLD-A315JBF0 | Thermistor holder [AF-R60CX] | 1 | AE |
| 3-16 | LHLD-A315JBF0 | Thermistor holder [AF-R70CX] | 1 | AE |
| 3-17 | PSEL-C250JBEZ | Evaporator insulator [AF-R50CX] | 1 | AB |
| 3-17 | PSEL-C250JBEZ | Evaporator insulator [AF-R55CX] | 1 | AB |
| 3-17 | PSEL-C289JBEZ | Evaporator insulator [AF-R60CX] | 1 | AC |
| 3-17 | PSEL-C289JBEZ | Evaporator insulator [AF-R70CX] | 1 | AC |
| 3-18 | LBND-A042JBE0 | Wire fixing band [AF-R50CX] | 1 | AC |
| 3-18 | LBND-A042JBE0 | Wire fixing band [AF-R55CX] | 1 | AC |
| 3-18 | LBND-A042JBE0 | Wire fixing band [AF-R60CX] | 1 | AC |
| 3-18 | LBND-A042JBE0 | Wire fixing band [AF-R70CX] | 2 | AC |
| 3-19 | QW-VZD775JBZZ | Overload relay wire [AF-R50CX] | 1 | AD |
| 3-19 | QW-VZD775JBZZ | Overload relay wire [AF-R55CX] | 1 | AD |
| 3-19 | QW-VZD775JBZZ | Overload relay wire [AF-R70CX] | 1 | AD |

## ACCESSORY PARTS

| | | | | |
|---|---|---|---|---|
| 4- 1 | TINSEA317JBRZ | Operation manual | 1 | AD |
| 4- 2 | LANGAA011JBFE | Left closure frame | 1 | AH |
| 4- 3 | LANGAA012JBFE | Right closure frame | 1 | AH |
| 4- 4 | PPLTPA016JBFB | Closure | 2 | AK |
| 4- 5 | PSEL-A931JBE0 | Window insulator | 1 | AH |
| 4- 6 | PSEL-A932JBE0 | Window insulator | 1 | AE |
| 4- 7 | PSEL-C251JBEZ | Window insulator | 1 | AC |
| 4- 8 | TCAD-A351JBEZ | Consummer card | 1 | AB |
| 4- 9 | DX-BZA016JBK0 | Screws kit | 1 | AW |
| 4-10 | SSAKAA018YDE0 | Bag | 1 | AB |
| 4-11 | XCTSD40P10000 | Tapping screw | 6 | AA |
| 4-12 | XMPSD40P25000 | Wood screw | 7 | AA |
| 4-13 | LANGAA030JBTA | Base pan angle | 2 | AD |
| 4-14 | CRMC-A526JBEZ | Remote control | 1 | AT |
| 4-15 | LHLD-A389JBFB | Controller holder | 1 | AC |
| 4-16 | SPADBA163JBEZ | Card board | 1 | AC |
| 4-17 | SSAKHA009JBEZ | Bag | 1 | AC |
| 4-18 | UBATUA027JBE0 | Battery pack | 1 | AE |
| 4-19 | CFZK-B975JBKZ | Closure ass'y | 1 | BB |

## PACKING PARTS

| | | | | |
|---|---|---|---|---|
| 5- 1 | DPADBA004JBFZ | Top pad ass'y | 1 | AH |
| 5- 2 | CPADBA046JBKZ | Bottom pad ass'y | 1 | AN |
| 5- 3 | SPAKCA928JBEZ | Packing case [AF-R50CX] | 1 | AQ |
| 5- 3 | SPAKCA995JBEZ | Packing case [AF-R55CX] | 1 | AS |
| 5- 3 | SPAKCA987JBEZ | Packing case [AF-R60CX] | 1 | AQ |
| 5- 3 | SPAKCA998JBEZ | Packing case [AF-R70CX] | 1 | AQ |
| 5- 4 | SSAKHA245YDE0 | Protect | 1 | AB |
| 5- 5 | SSAKAA053YDE0 | Bag | 1 | AB |
| 5- 6 | TLABMA325JBRZ | Color label [AF-R55CX] | 1 | AC |

## SCREWS AND NUTS

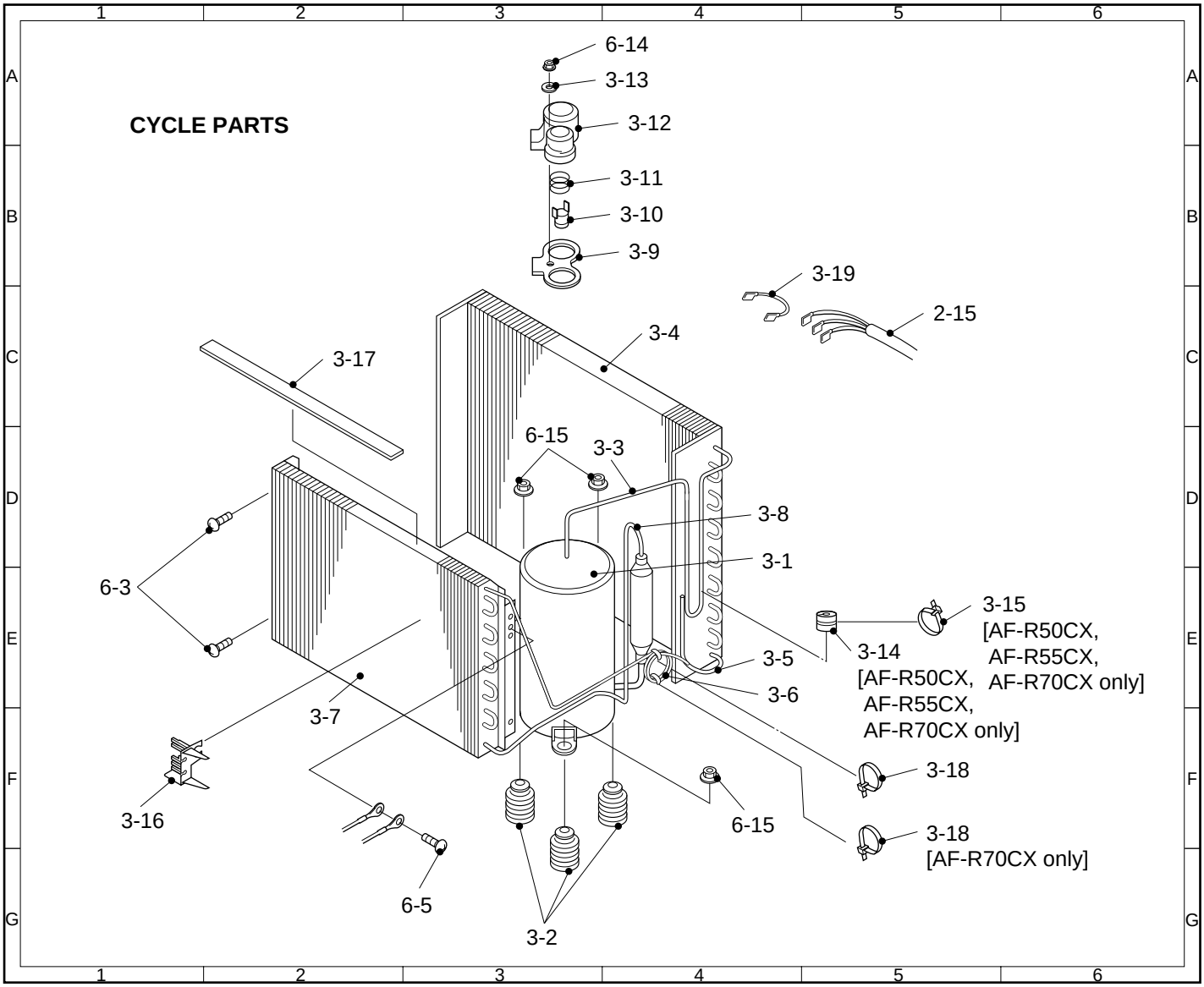
| | | | | |
|---|---|---|---|---|
| 6- 1 | XTTSD40P20000 | Tapping screw | 4 | AA |
| 6- 2 | XCTWJ40P16000 | Tapping screw | 2 | AA |

| REF. NO. | PART NO. | DESCRIPTION | Q'TY | CODE |
|---|---|---|---|---|
| 6- 3 | XTTSD40P14000 | Tapping screw | 7 | AA |
| 6- 4 | XTTSD40P12000 | Tapping screw [AF-R50CX] | 13 | AA |
| 6- 4 | XTTSD40P12000 | Tapping screw [AF-R55CX] | 13 | AA |
| 6- 4 | XTTSD40P12000 | Tapping screw [AF-R70CX] | 13 | AA |
| 6- 4 | XTTSD40P12000 | Tapping screw [AF-R60CX] | 14 | AA |
| 6- 5 | XHTSD40P10000 | Tap tight screw | 6 | AA |
| 6- 6 | XHTSD40P08000 | Tap tight screw | 4 | AA |
| 6- 7 | XTPSD40P08000 | Tapping screw | 3 | AA |
| 6- 8 | LX-BZA236JBE0 | Special screw | 1 | AC |
| 6- 9 | LX-CZA038WRE0 | Special screw | 4 | AA |
| 6-10 | LX-HZA001JBE0 | Special screw | 1 | AB |
| 6-11 | LX-BZA140JBE0 | Special screw | 2 | AB |
| 6-12 | XBPSD40P12J00 | Machine screw | 2 | AB |
| 6-13 | LX-NZA074JBE0 | Special nut | 1 | AB |
| 6-14 | LX-NZA103JBE0 | Frange nut [AF-R50CX] | 1 | AF |
| 6-14 | LX-NZA103JBE0 | Frange nut [AF-R55CX] | 1 | AF |
| 6-14 | LX-NZA103JBE0 | Frange nut [AF-R70CX] | 1 | AF |
| 6-14 | LX-NZA148JBE0 | Frange nut [AF-R60CX] | 1 | AB |
| 6-15 | LX-NZA026JBE0 | Special nut | 3 | AC |

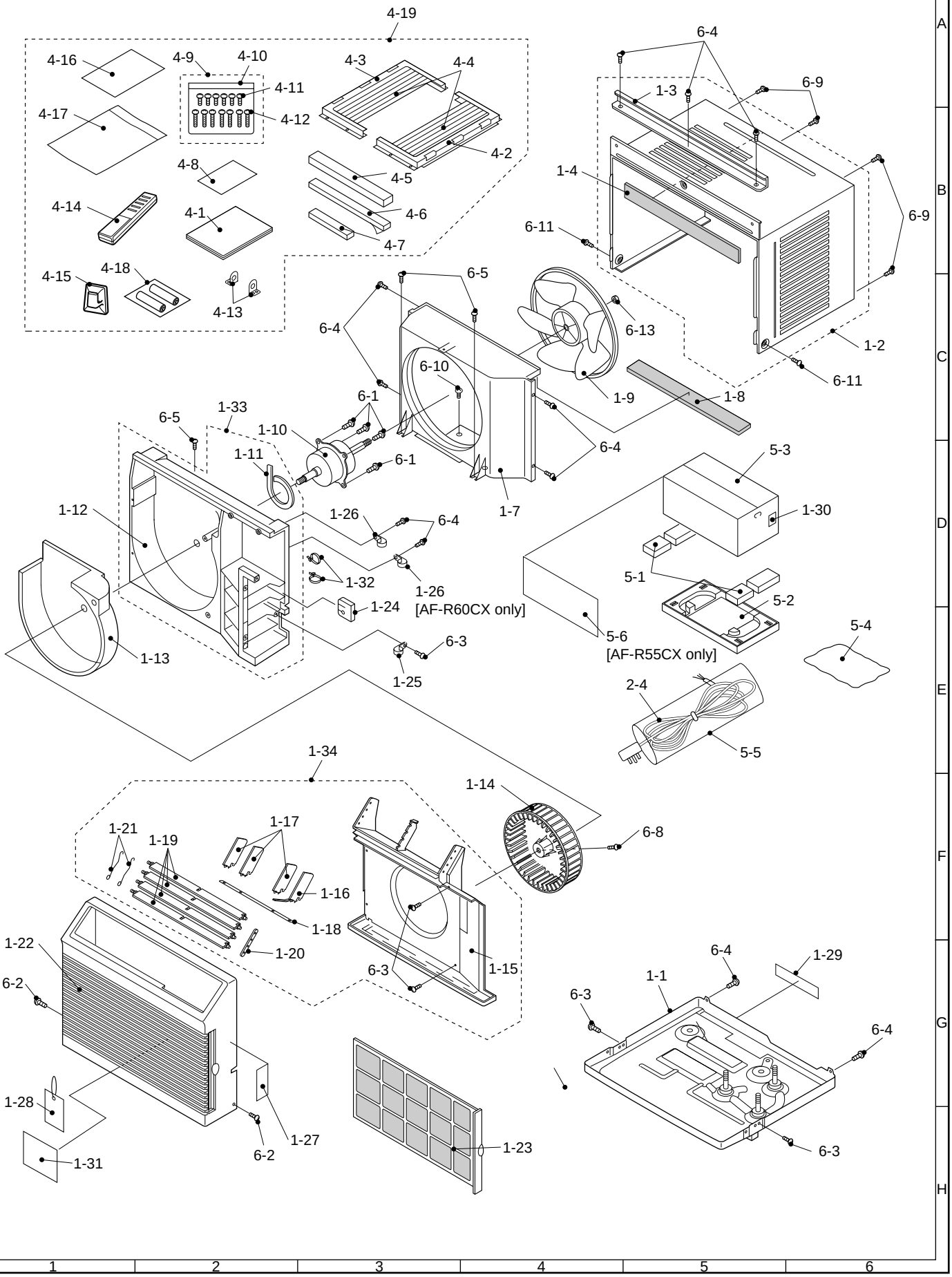
HOW TO ORDER REPLACEMENT PARTS

To have your order filled prompty and correctly, please furnish the following information.

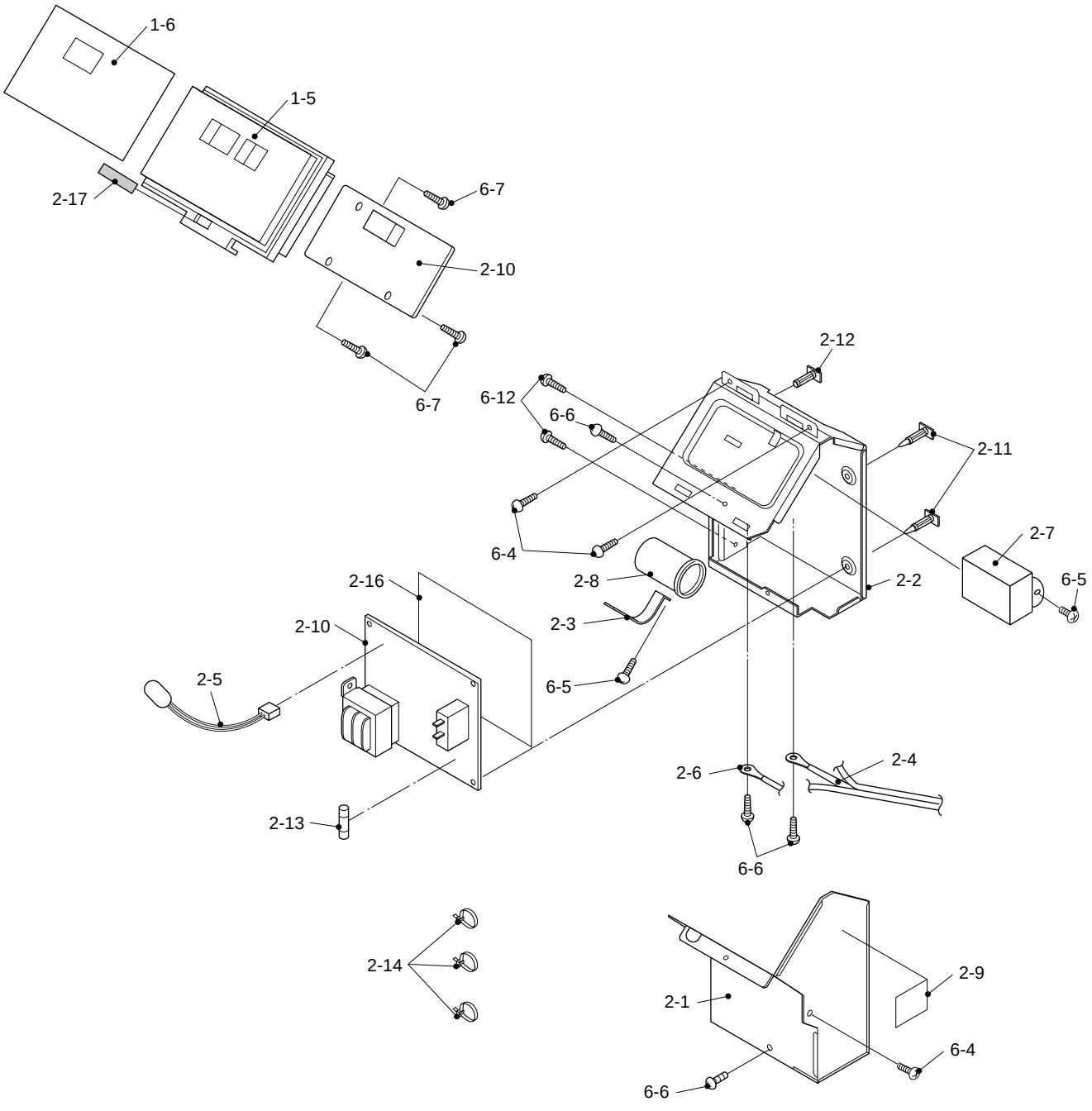
1. MODEL NUMBER 2. REF. NO. 3. PART NO. 4. DESCRIPTION



## CABINET PARTS



## CONTROL BOX PARTS



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